website http://www.lgservice.com

LG
Room Air Conditioner

SERVICE MANUAL

MODELS: LAN121CNM (ASNC121ERH0)
LAU121CNM (ASUC121EUH0)
LA121HPMI (ASNH121ERH0)
LA121HPMO (ASUH121EUH0)
LAN121HNM (ASNH121ERH0)
LAU121HNM (ASUH121EUH0)
LA121CPMI (ASNC121ERH0)
LA121CPMO (ASUC121EUH0)

CAUTION

- **BEFORE SERVICING THE UNIT, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.**
- **ONLY FOR AUTHORIZED SERVICE PERSONNEL.**

TABLE OF CONTENTS

Safety Precautions

To prevent injury to the user or other people and property damage, the following instructions must be followed.

■ Incorrect operation due to ignoring instruction will cause harm or damage. The seriousness is classified by the following indications.

⚠**WARNING**	This symbol indicates the possibility of death or serious injury.
⚠**CAUTION**	This symbol indicates the possibility of injury or damage to properties only.

■ Meanings of symbols used in this manual are as shown below.

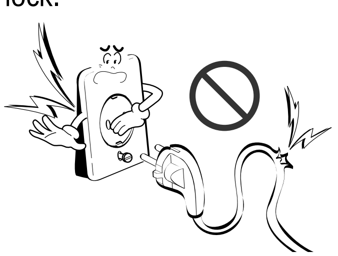
⊘	**Be sure not to do.**
❗	**Be sure to follow the instruction.**

⚠WARNING

■ Installation

Do not use damaged power cords, plugs, or a loose socket.

• There is risk of fire or electric shock.



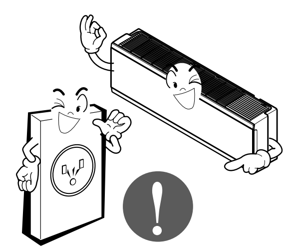
For electrical work, contact the dealer, seller, a qualified electrician, or an Authorized Service Center.

• There is risk of fire or electric shock.



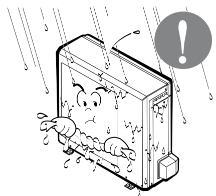
Always use the power plug and socket with the ground terminal.

• There is risk of electric shock.



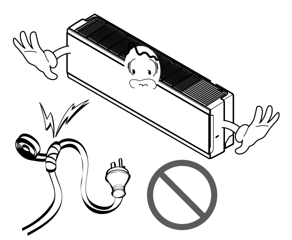
Install the panel and the cover of control box securely.

• There is risk of fire or electric shock.



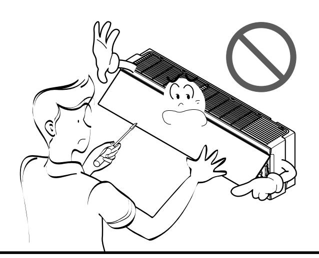
Do not modify or extend the power cord.

• There is risk of fire or electric shock.



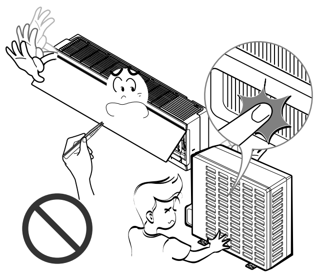
Do not install, remove, or re-install the unit by yourself (customer).

• There is risk of fire, electric shock, explosion or injury.



Be cautious when unpacking and installing the product.

- Shape edges could cause injury. Be especially careful of the sharp edges.



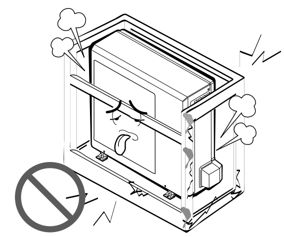
For installation, always contact the dealer or an Authorized Service Center.

- There is risk of fire, electric shock, explosion, or injury.



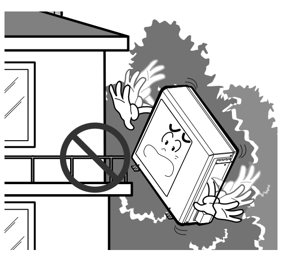
Do not install the product on a defective installation stand.

- It may cause injury, accident, or damage to the product.



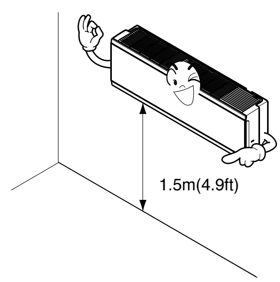
Be sure the installation area does not deteriorate with age.

- If the base collapses, the air conditioner could fall with it, causing property damage, product failure, and personal injury.



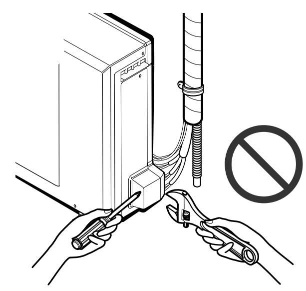
Install the indoor unit on the wall where the height from the floors more then 1.5m(4.9ft)

- There are sharp moving parts that could cause personal injury.



Do not handle the pipe by yourself(customer)

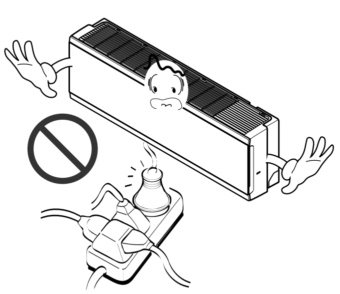
- High-Pressure refrigent may cause personal injury.



■ Operation

Use a dedicated outlet for this appliance.

- There is risk of fire or electric shock.



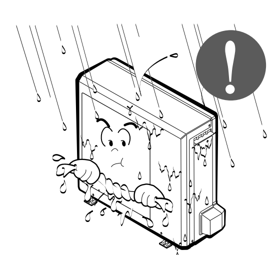
Grasp the plug to remove the cord from the outlet. Do not touch it with wet hands.

- There is risk of fire or electric shock.



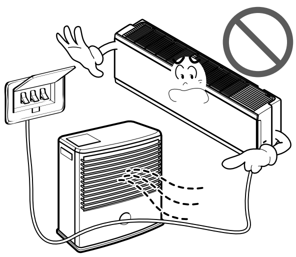
Do not allow water to run into electric part.

- There is risk of fire, failure of the product, and/or electric shock.



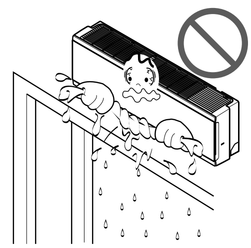
Do not place a heater or other appliances near the power cable.

- There is risk of fire, failure of the product, and/or electric shock.



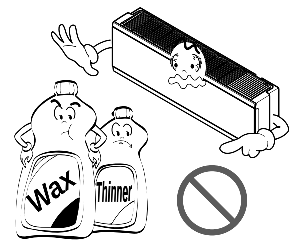
Do not let the air conditioner run for a long time when the humidity is very high and a door or a window is left open.

- Moisture may condense and wet or damage furnishings.



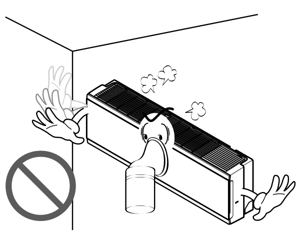
Do not store of use flammable gas or combustibles near the air conditioner.

- There is risk of fire or product failure.



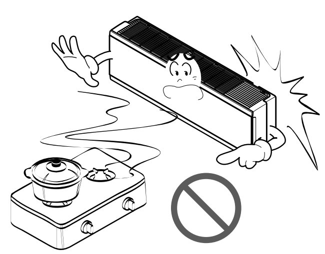
Do not use the product in a tightly closed space for a long time.

- Oxygen deficiency could occur.
- Some ventilation by opeing window is necessary for the fresh air.



When flammable gas leaks, turn off the gas and open a window for ventilation before turning the product on. Do not use the telephone or turn switches on or off.

- There is risk of explosion or fire.



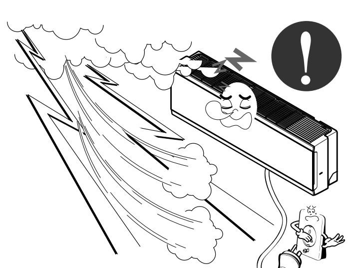
Unplug the unit if strange sounds odors or smoke comes from it.

- There is risk of fireproduct failure and/or electric shock.



Stop operation and close any window in storm or hurricane. before the hurricane arrives.

- There is risk of property damage, failure of product, or electric shock.



Do not open the inlet grill of the product during operation. (Do not touch the electrostatic filter, if the unit is so equipped.)

- There is risk of physical injury, electric shock, or product.



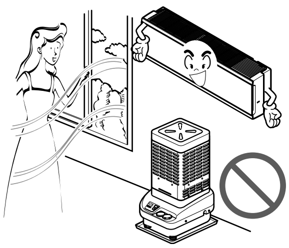
When the product is soaked (flooded or submerged), contact an Authorized Service Center.

- There is risk of electrical shock.



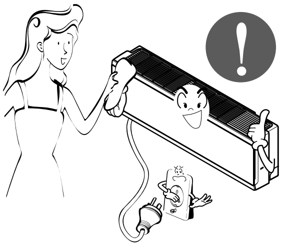
Ventilate the product from time to time when operating it together with a stove, etc.

• There is risk of fire or electrical shock.



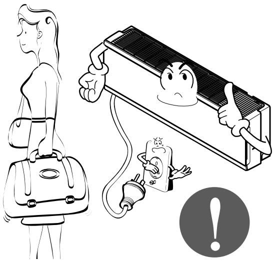
Unplug the appliance before performing cleaning or maintenance.

• There is risk of electric shock.



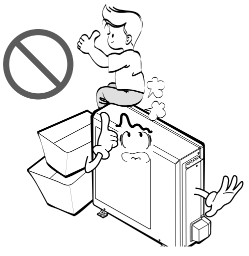
When the product is not be used for a long time disconnect the power supply plug or turn off the breaker.

• There is risk of product damage or failure, or unintended operation.



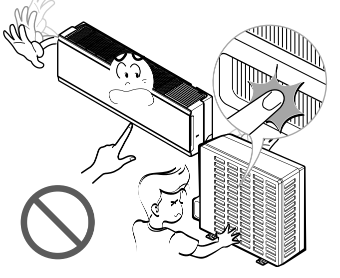
Take care to ensure that nobody could step on or fall onto the outdoor unit.

• There could result in personal injury and product damage.



Do not insert hands or other objects through the air inlet or outlet while the air conditioner is plugged in.

• There are sharp and moving parts that could cause personal injury.

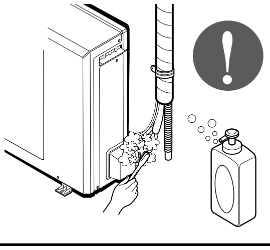


⚠CAUTION

■ Installation

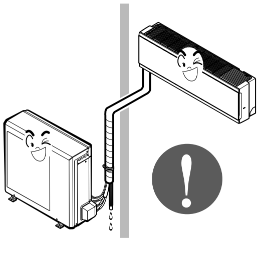
Always check for gas(refrigerant) leakage after installation or repair of product.

• Low refrigerant levels may cause product failure.



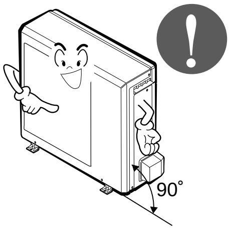
Install the drain hose to ensure that water is drained away properly.

• A bad connection may cause water leakage.



Keep level even when installing the product.

• To avoid vibration or water leakage.



Do not install the product where the noise or hot air from the outdoor unit could damage the neighborhoods.

- It may cause a problem for your neighbors.



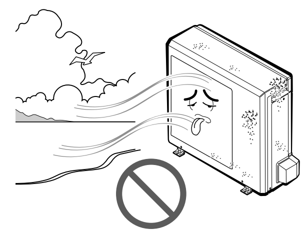
Use two or more people to lift and transport the air conditioner

- Avoid personal injury.



Do not install the product where it will be exposed to sea wind (salt spray) directly.

- It may cause corrosion in the product. Corrosion, particularly on the condenser and evaporator fins, could cause product malfunction or inefficient operation.



■ Operation

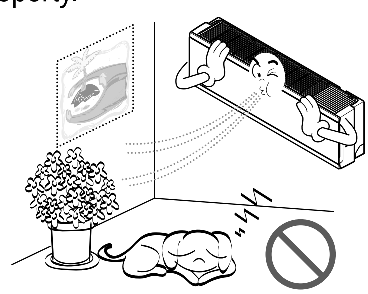
Do not direct airflow at room occupants.

- This could damage your health.



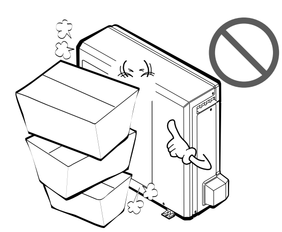
Do not use the product for special purposes, such as preserving foods, works of art, etc. It is a consumer air conditioner, not a precision refrigeration system.

- There is risk of damage or loss of property.



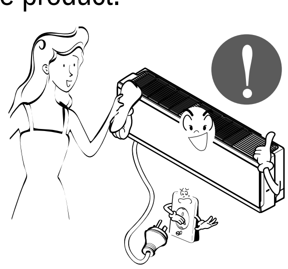
Do not block the inlet or outlet of air flow.

- It may cause product failure.



Use a soft cloth to clean. Do not use harsh detergents, solvents, etc.

- There is risk of fire, electric shock or damage to the plastic parts of the product.



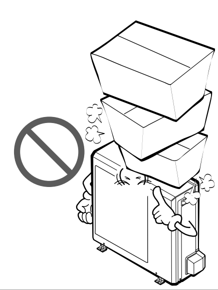
Do not touch the metal parts of the product when removing the air filter. They are very sharp!

- There is risk of personal injury.



Do not step on or put anything on the product. (outdoor unit)

- There is risk of personal injury and failure of product.



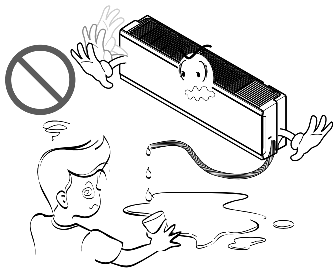
Always insert the filter securely. Clean the filter every two weeks or more often if necessary.

- A dirty filter reduces the efficiency of the air conditioner and



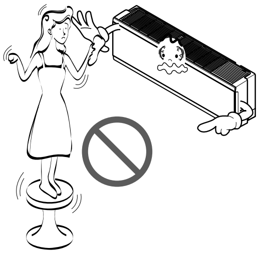
Do not drink the water drained from the unit.

- It is not sanitary and could cause serious health issues.



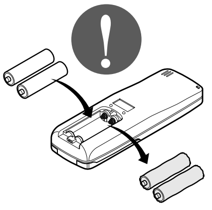
Use a firm stool or ladder when cleaning or maintaining the air conditioner.

- Be careful and avoid personal injury.



Replace all the batteries in the remote.

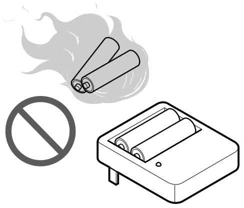
- There is risk of fire or explosion.



■ Disuse

Do not recharge or disassemble the batteries. Do not dispose of batteries in a fire.

- They may burn or explode.



If the liquid from the batteries gets onto your skin or clothes, wash it well with clean water. Do not use the remote if the batteries have leaked.

- The chemicals in batteries could cause burns or other health hazards.



Dimensions

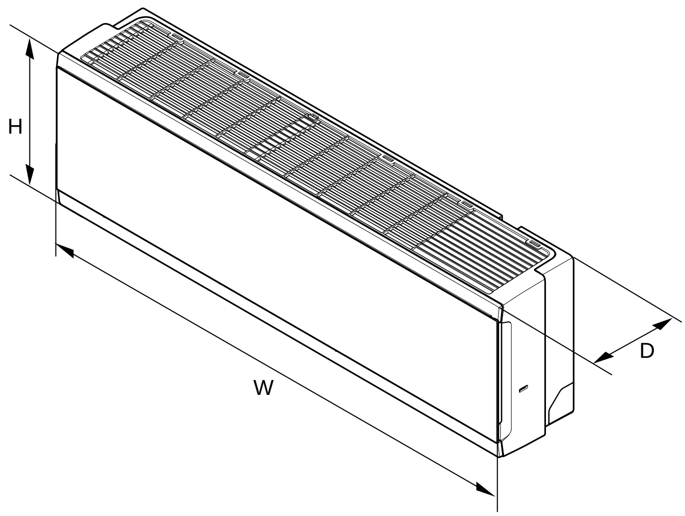
Symbols Used in this Manual

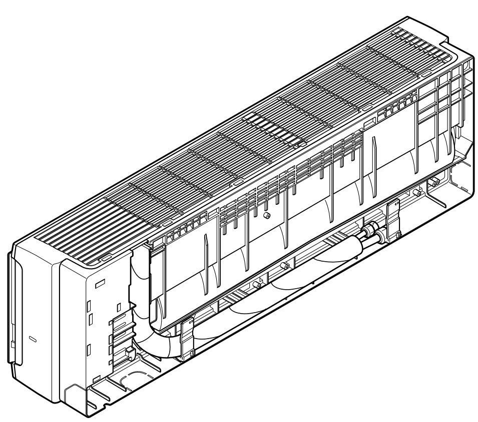
This symbol alerts you to the risk of electric shock.

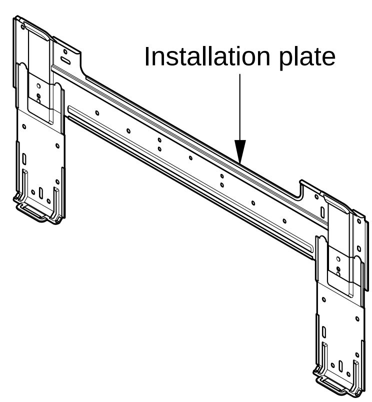
This symbol alerts you to hazards that could cause harm to the air conditioner.

NOTICE **This symbol indicates special notes.**

Indoor Unit



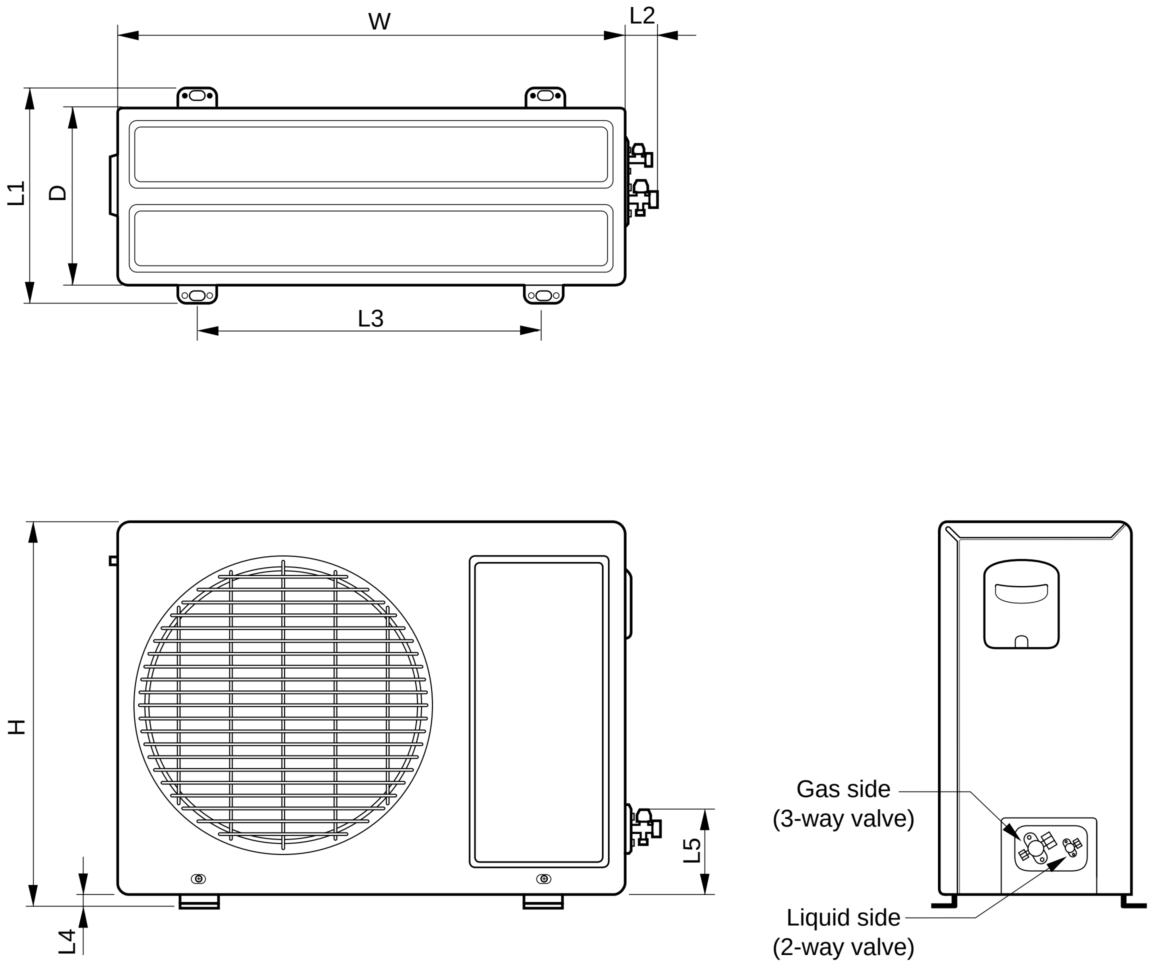




Dimension \ Model		12k Btu Series
W	mm	915(36.0)
H	mm	282(11.1)
D	mm	165(6.5)

Outdoor Unit

1. 12k



DIM	MODEL unit	12k
W	mm(inch)	770(30.3)
H	mm(inch)	540(21.3)
D	mm(inch)	245(9.6)
L1	mm(inch)	287(11.3)
L2	mm(inch)	64(2.5)
L3	mm(inch)	518(20.4)
L4	mm(inch)	10(0.4)
L5	mm(inch)	100(3.9)

Introduction

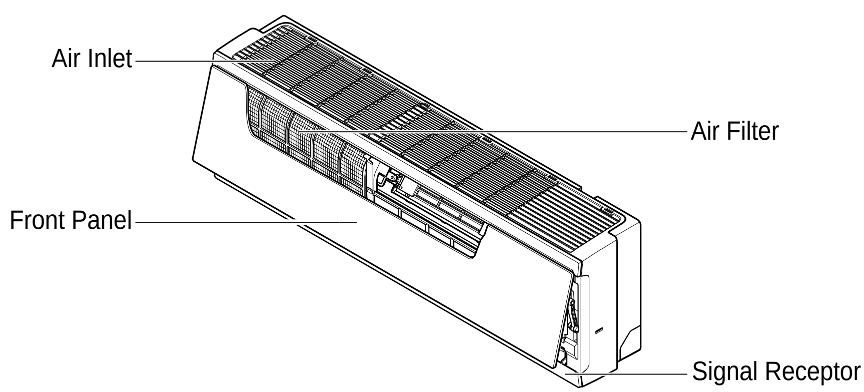
Symbols Used In This Manual

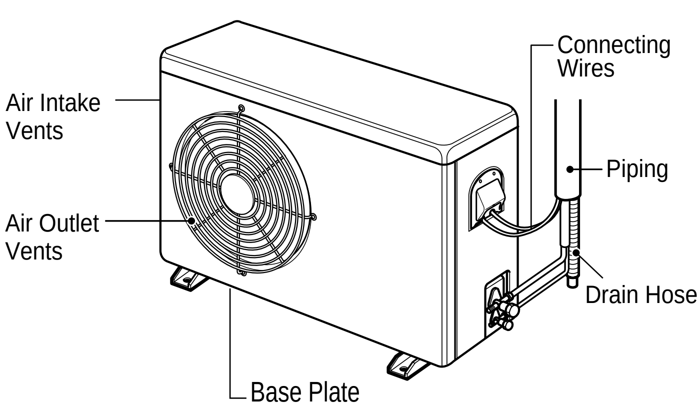
This symbol alerts you to the risk of electric shock.

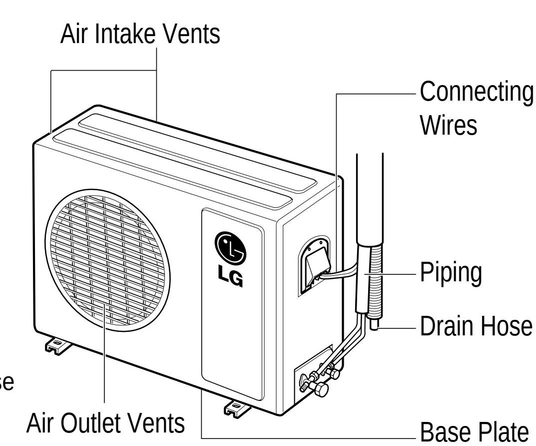
This symbol alerts you to hazards that may cause harm to the air conditioner.

NOTICE **This symbol indicates special notes.**

Features







Installation

Read carefully, and then follow step by step.

Installation Parts

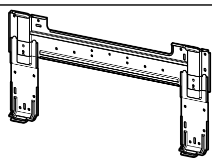
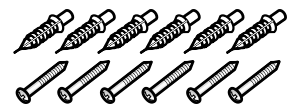
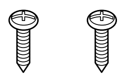
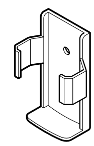
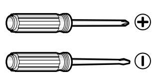
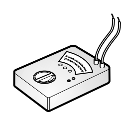
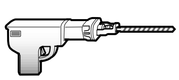
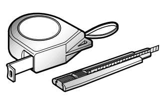
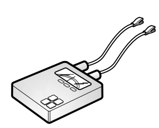
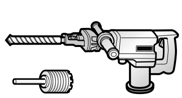
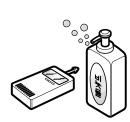
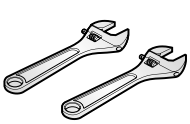
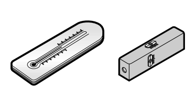
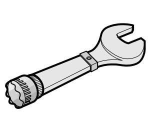
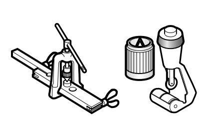
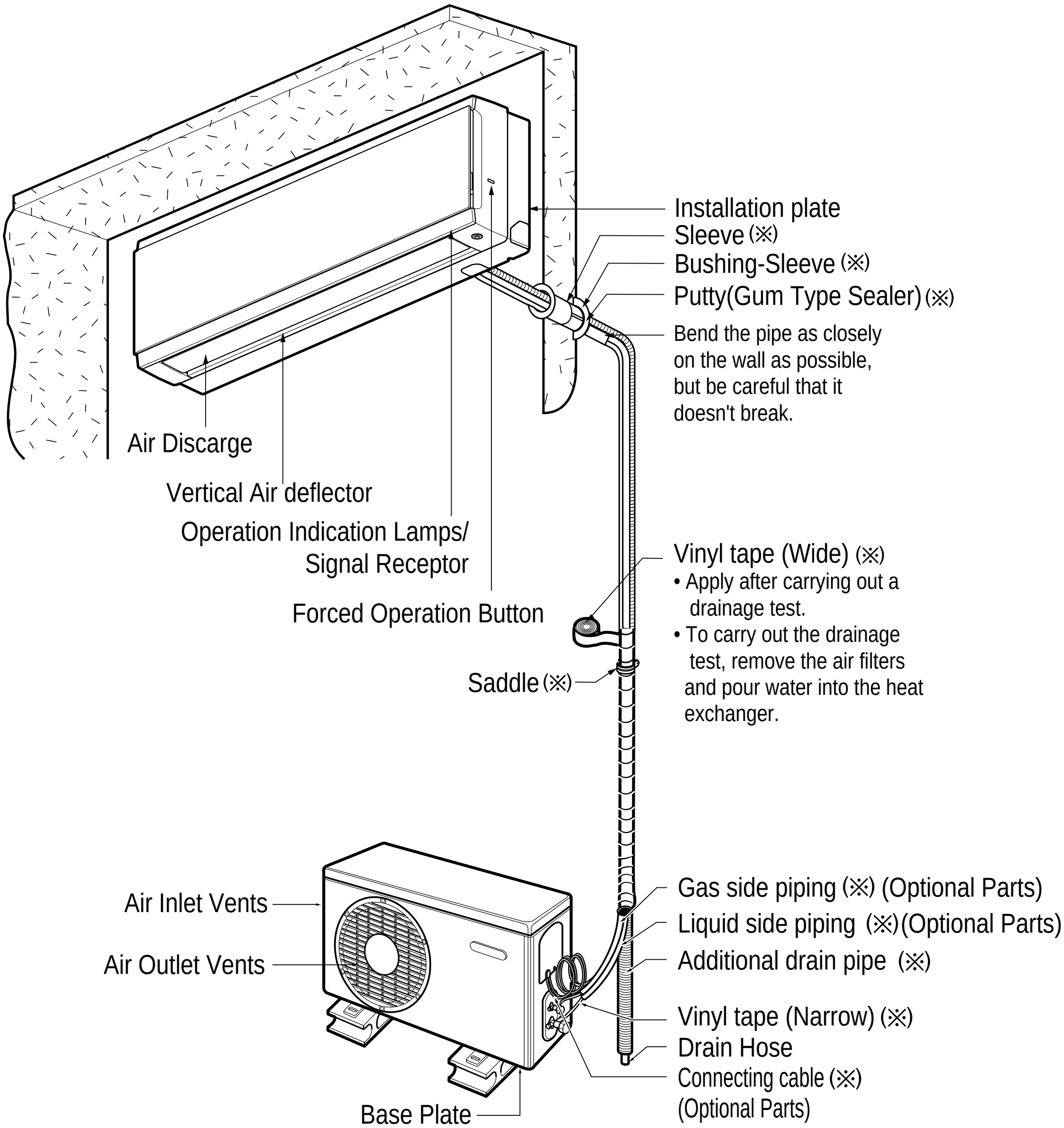
Installation plate	Type "A" screw and plastic anchor
	
Type "B" screw	Remote Control Holder
	

Figure	Name	Figure	Name
	Screw driver		Ohmmeter
	Electric Drill		Hexagonal wrench
	Measuring Tape, Knife		Ammeter
	Hole Core Drill		Gas Leak Detector
	Spanner		Thermometer, Level
	Torque wrench		Flaring Tool Set

Installation Map

NOTICE

Installation parts you should purchase. (※)



Confirm The Refrigerant

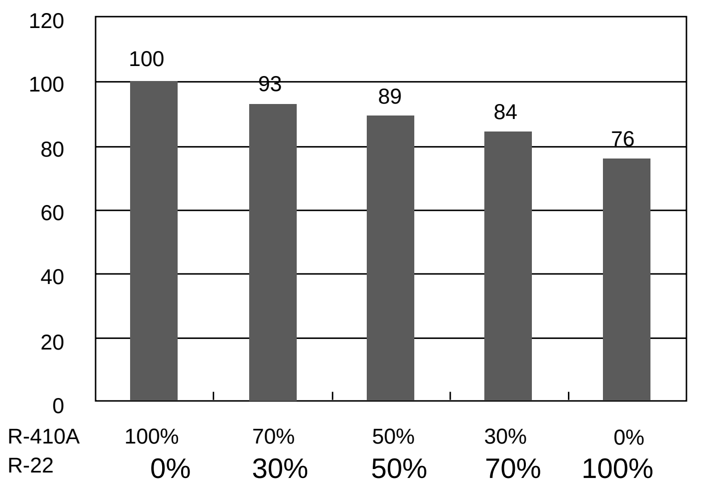
1. Check the quality label on the indoor and outdoor unit.
2. Make certain that the refrigerant is R-410A.

NOTICE

THIS PRODUCT CONTAINS R-410A REFRIGERANT

1) Different compressor oil
   - R-410A(Polyol ester) / R-22(Mineral).
   - Do not mix the existing mineral oil.
   - Do not apply used pipe, tools and gauges covered with the existing mineral oil.
2) Absorption of moisture
   -Compressor's oil has the high absorption rate of moisture.
3) Composition
   - R-410A(R32:R125=50:50wt%).
   NOTE: Never mix with other refrigerants

Example : Split type 12,000 Btu/h



4) High pressure.
   - 1.6 times higher than R-22.
   - High Pressure refrigerant may cause personal injury.

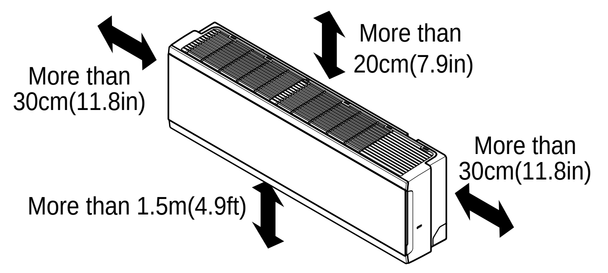
	Boiling Pt.(°C)	Vapor pressure(25°C)(kg f/cnf)	Vapor density(25°C)(kg/m^2)
R-410A	-51.4	15.9	64
R-22	-40.8	9.6	44.4

Do not handle the pipe by yourself (customer) High-pressure refrigerant may cause personal injury.
- manifold gauge ,charging and any piping tools must be dedicated to R-410A systems.

Select the Best Location

Indoor unit

1. Do not have any heat or steam near the unit.
2. Select a place where there are no obstacles in front of the unit.
3. Make sure that condensation drainage can be conveniently routed away.
4. Do not install near a doorway.
5. Ensure that the space around the left and right of the unit is more than 30cm(11.8in). The unit should be installed as high on the wall as possible, allowing a minimum of 20cm(7.9in) from ceiling.
6. Use a stud finder to locate studs to prevent unnecessary damage to the wall.

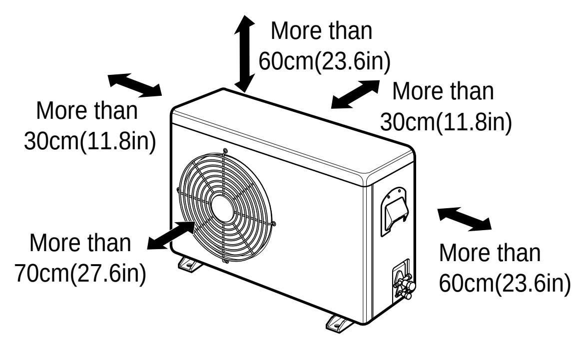


⚠ CAUTION

Install the indoor unit on the wall where the height from the floors more than 1.5meters(7.9ft).
A minimum pipe run of 7.5meters(24.6ft) is required to minimize vibration and excessive noise.

Outdoor unit

1. If an awning is built over the unit to prevent direct sunlight or rain exposure, make sure that heat radiation from the condenser is not restricted.
2. Ensure that the space around the back and sides is more than 30cm(11.8in). The front of the unit should have more than 70cm(27.6in) of space.
3. Do not place animals and plants in the path of the warm air.
4. Take the air conditioner weight into account and select a place where noise and vibration are minimum.
5. Select a place so that the warm air and noise from the air conditioner do not disturb neighbors.



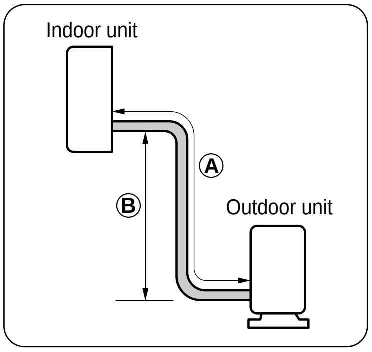
Rooftop Installations

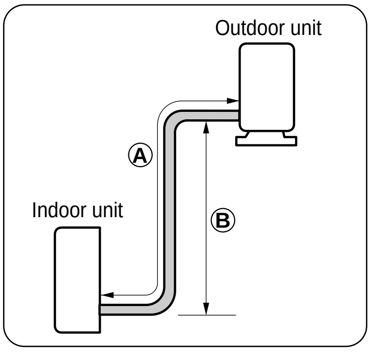
If the outdoor unit is installed on a roof structure, be sure to level the unit. Ensure the roof structure and anchoring method are adequate for the unit location. Consult local codes regarding rooftop mounting.

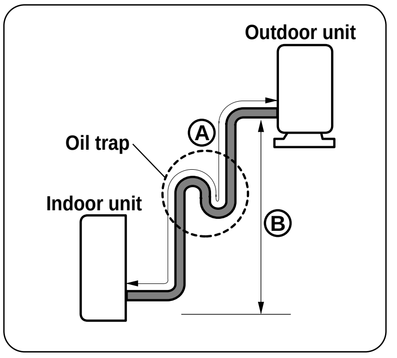
If the outdoor unit is installed on roof structures or walls, this may result in excessive noise and vibration, and may be also classed as non serviceable installation.

Piping Length and Elevation

Capacity (Btu/h)	Pipe Size		Standard Length m(ft)	Max. Elevation Ⓑ m(ft)	Max. length Ⓐ m(ft)	Additional Refrigerant g/m(oz/ft)
	Suction	Evap				
12k	Ø12.7(1/2")	Ø6.35(1/4")	7.5(25)	7.5(25)	15(49)	20(0.22)







In case more than 5m(16.4ft)

⚠ CAUTION

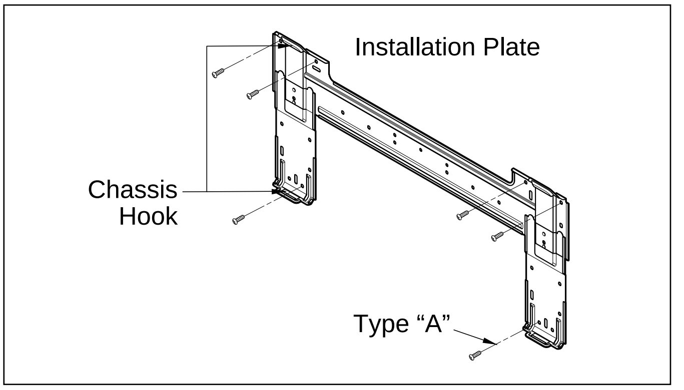
- Capacity is based on standard length and maximum allowance length is on the basis of reliability.
- Oil trap should be installed every 5~7meters (16.4~23.0ft).

How to Mount Installation Plate

The wall you select should be strong and solid enough to prevent vibration

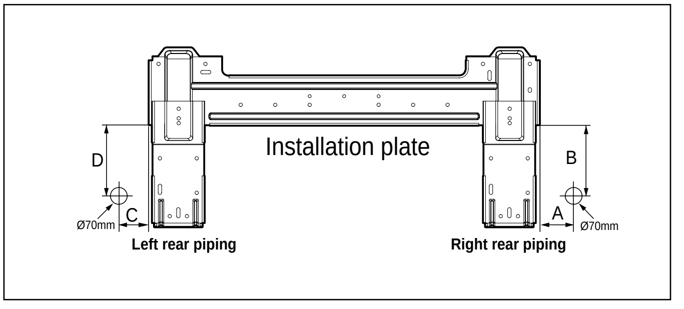
1. Mount the installation plate on the wall with type "A" screws. If mounting the unit on a concrete wall, use anchor bolts.

• Mount the installation plate horizontally by aligning the centerline using a level.

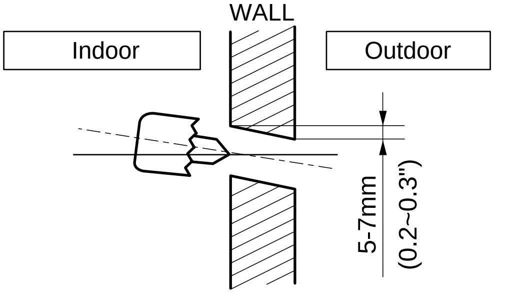


2. Measure the wall and mark the centerline. It is also important to use caution concerning the location of the installation plate-routing of the wiring to power outlets is through the walls typically. Drilling the hole through the wall for piping connections must be done safely.

CHASSIS (Grade)	Distance [mm(in)]			
	A	B	C	D
SE	65(2.6)	110(4.3)	85(3.3)	110(4.3)



• Drill the piping hole with a ø70mm(2.76in) hole core drill. Drill the piping hole at either the right or the left with the hole slightly slanted to the outdoor side.

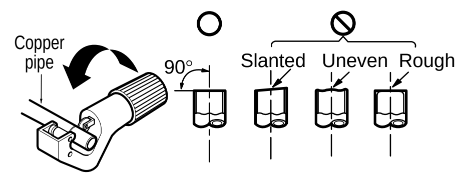


Flaring Work

Main cause for gas leakage is due to defect in flaring work. Carry out correct flaring work in the following procedure.

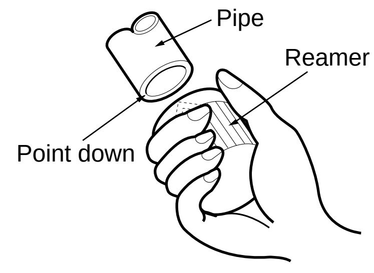
Cut the pipes and the cable.

1. Use the piping kit accessory or the pipes purchased locally.
2. Measure the distance between the indoor and the outdoor unit.
3. Cut the pipes a little longer than measured distance.
4. Cut the cable 1.5m(59.1in) longer than the pipe length.



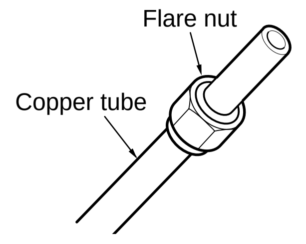
Burrs removal

1. Completely remove all burrs from the cut cross section of pipe/tube.
2. Put the end of the copper tube/pipe in a downward direction as you remove burrs in order to avoid dropping burrs into the tubing.



Putting nut on

• Remove flare nuts attached to indoor and outdoor unit, then put them on pipe/tube having completed burr removal.
(not possible to put them on after flaring work)

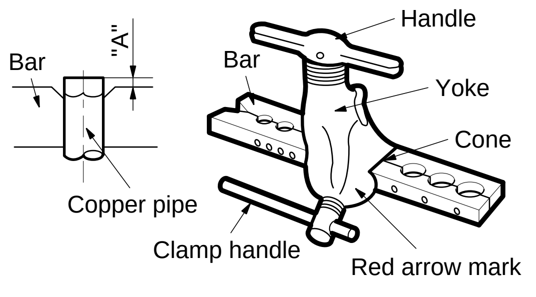


Flaring work

• Carry out flaring work using flaring tool as shown below.

Outside diameter		A	
mm	inch	mm	inch
Ø6.35	1/4	1.1~1.3	0.043~0.051
Ø9.52	3/8	1.5~1.7	0.059~0.066
Ø12.7	1/2	1.6~1.8	0.063~0.070
Ø15.88	5/8	1.6~1.8	0.063~0.070
Ø19.05	3/4	1.9~2.1	0.074~0.082

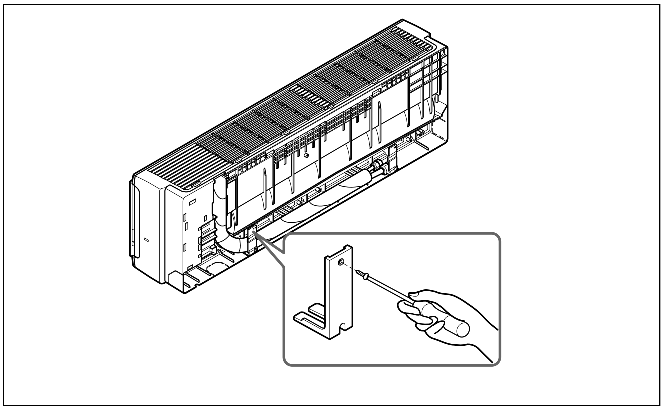
Firmly hold copper pipe in a die in the dimension shown in the table above.



Connecting The Piping

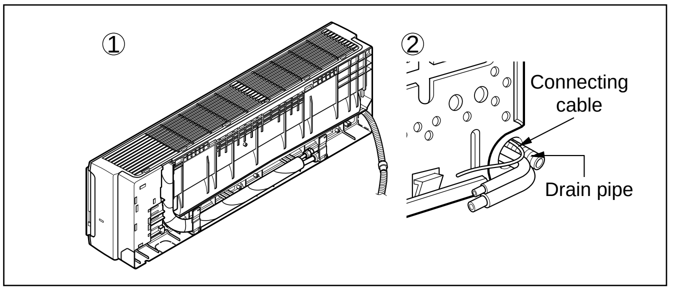
Indoor

1. Prepare the indoor unit's piping and drain hose for installation through the wall.
2. Remove the plastic tubing retainer(see the illustration by) and pull the tubing and drain hose away from chassis.
3. Replace only the plastic tubing holder 1, not the holder 2 in the original position.



For left rear piping

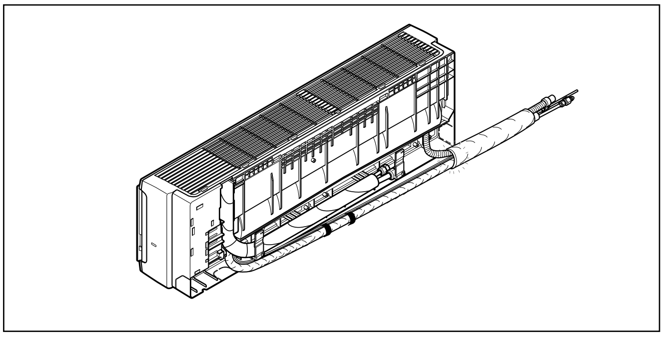
Route the indoor tubing and the drain hose in the direction of rear left.



Insert the connecting cable into the indoor unit from the outdoor unit through the piping hole.

- Do not connect the cable to the indoor unit.
- Make a small loop with the cable for easy connection later.

Tape the tubing, drain hose and the connecting cable. Be sure that the drain hose is located at the lowest side of the bundle. Locating at the upper side can cause drain pan to overflow inside the unit.

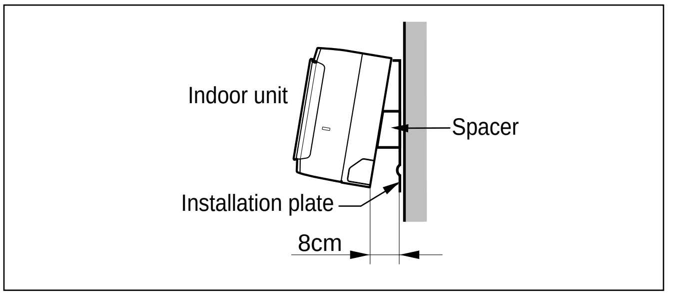


NOTICE

If the drain hose is routed inside the room, insulate the hose with an insulation material* so that dripping from "sweating"(condensation) will not damage furniture or floors.
*Foamed polyethylene or equivalent is recommended.

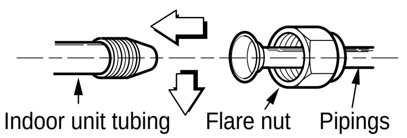
Indoor unit installation

- Hook the indoor unit onto the upper portion of the installation plate.(Engage the three hooks of the rear top and rear lower of the indoor unit with the upper edge and lower edge of the installation plate.) Ensure that the hooks are properly seated on the installation plate by moving it left and right.

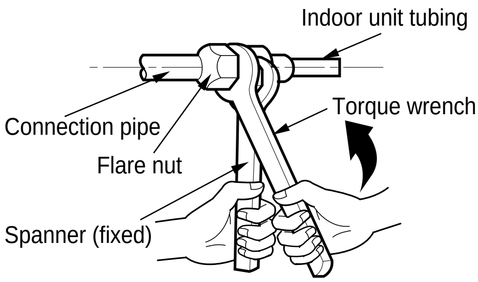


Connecting the pipings to the indoor unit and drain hose to drain pipe.

- Put a couple drops of refrigerant oil on the face of the flare before assembling taking care not to add any contaminants.
- Align the center of the pipings and sufficiently tighten the flare nut by hand.

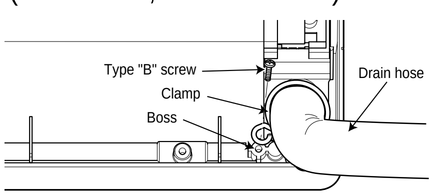


- Tighten the flare nut with a wrench.

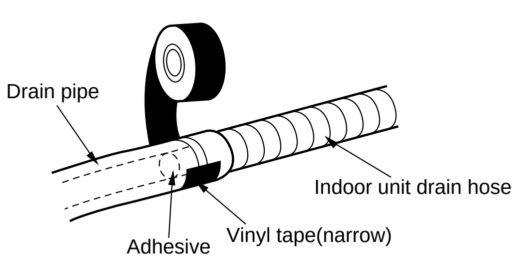


Outside diameter		Torque
mm	inch	kgf·cm
Ø6.35	1/4	180~250
Ø9.52	3/8	340~420
Ø12.7	1/2	550~660
Ø15.88	5/8	630~820
Ø19.05	3/4	980~1210

- Mount the clamp on the boss with a type "B" screw.(SE-H/P: 9k, 12k   C/O: 12k)

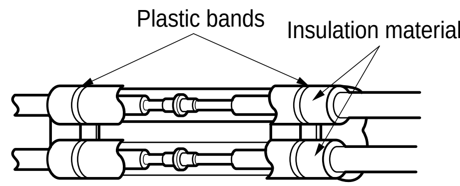


- When extending the drain hose at the indoor unit, install the drain pipe.

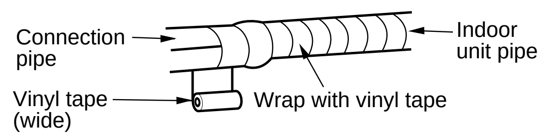


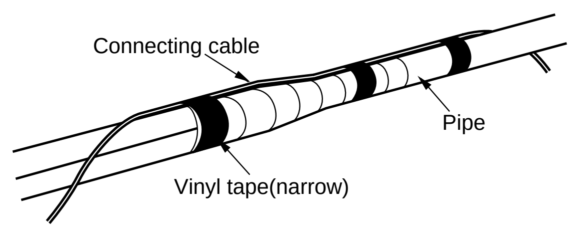
Wrap the insulation material around the connecting portion.

- Overlap the connection pipe insulation material and the indoor unit pipe insulation material. Bind them together with vinyl tape so that there is no gap.

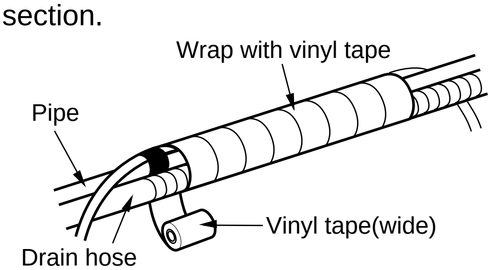


- Wrap the area which accommodates the rear piping housing section with vinyl tape.



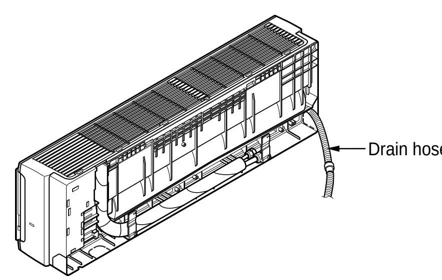


- Bundle the piping and drain hose together by wrapping them with vinyl tape over the range within which they fit into the rear piping housing section.



For right rear piping

Route the indoor tubing and the drain hose to the required piping hole position.



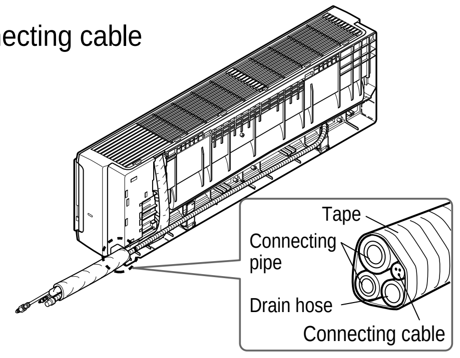
Insert the connecting cable into the indoor unit.

• Don't connect the cable to the indoor unit.

• Make a small loop with the cable for easy connection later.

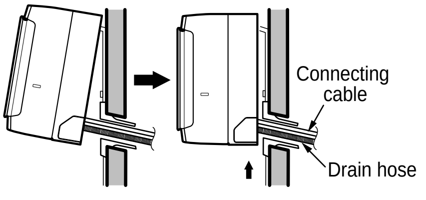
Tape the drain hose and the connecting cable.

• Connecting cable



Indoor unit installation

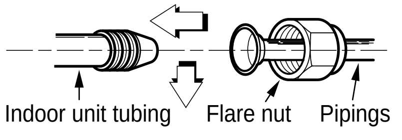
• Hook the indoor unit onto the upper portion of the installation plate.(Engage the three hooks of the rear top and rear lower of the indoor unit with the upper edge and lower edge of the installation plate.) Ensure that the hooks are properly seated on the installation plate by moving it left and right.



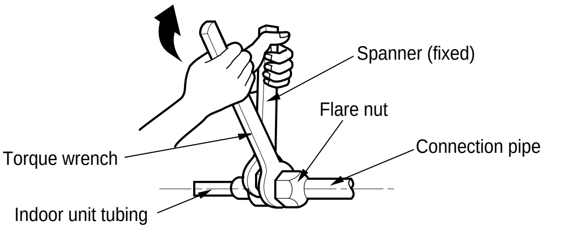
Connecting the pipings to the indoor unit and the drain hose to drain pipe.

• Put a couple drops of refrigerant oil on the face of the flare before assembling taking care not to add any contaminants

• Align the center of the pipings and sufficiently tighten the flare nut by hand.

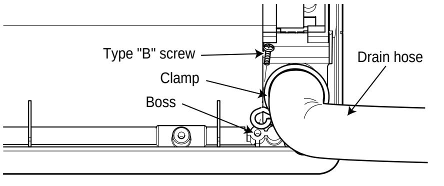


• Tighten the flare nut with a wrench.

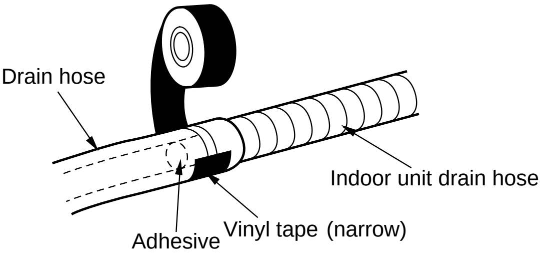


Outside diameter		Torque
mm	inch	kgf·cm
Ø6.35	1/4	180~250
Ø9.52	3/8	340~420
Ø12.7	1/2	550~660
Ø15.88	5/8	630~820
Ø19.05	3/4	980~1210

• Mount the clamp on the boss with a type "B" screw.(SE-H/P: 9k, 12k C/O: 12k)

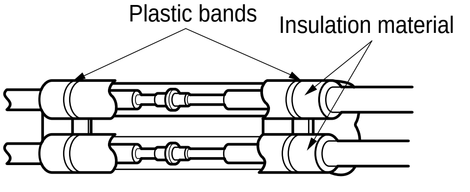


• When extending the drain hose at the indoor unit, install the drain pipe.

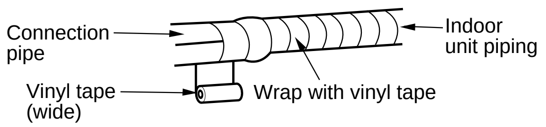


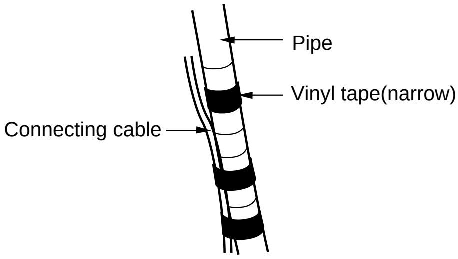
Wrap the insulation material around the connecting portion.

• Overlap the connection pipe heat insulation and the indoor unit pipe heat insulation material. Bind them together with vinyl tape so that there is no gap.

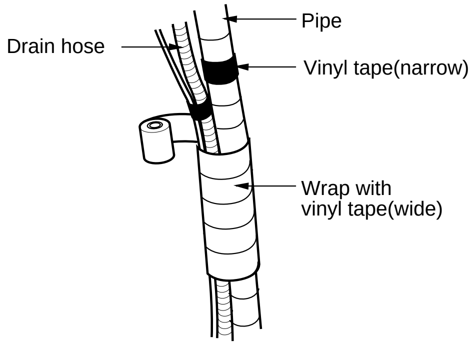


• Wrap the area which accommodates the rear piping housing section with vinyl tape.

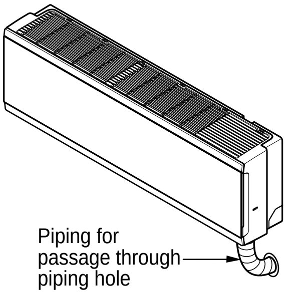




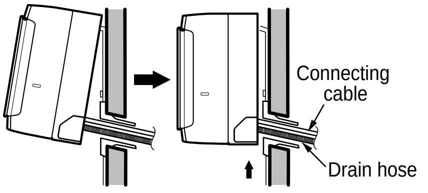
• Bundle the piping and drain hose together by wrapping them with cloth tape over the range within which they fit into the rear piping housing section.



Reroute the pipings and the drain hose across the back of the chassis.



Reroute the pipings and the drain hose across the back of the chassis.

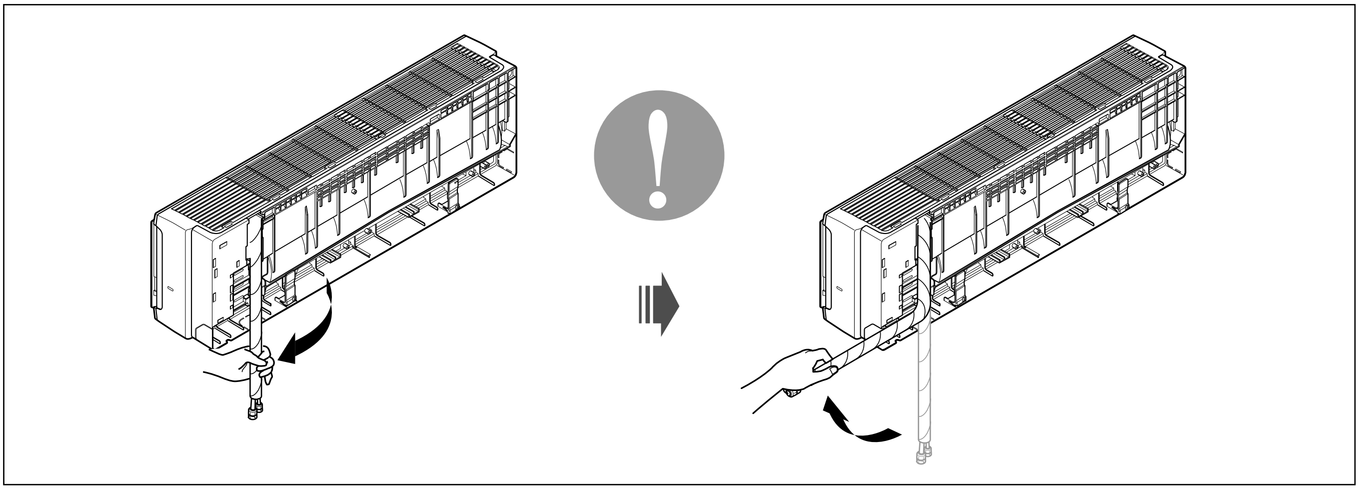


⚠ CAUTION

Installation Information. For left piping. Follow the instruction below.

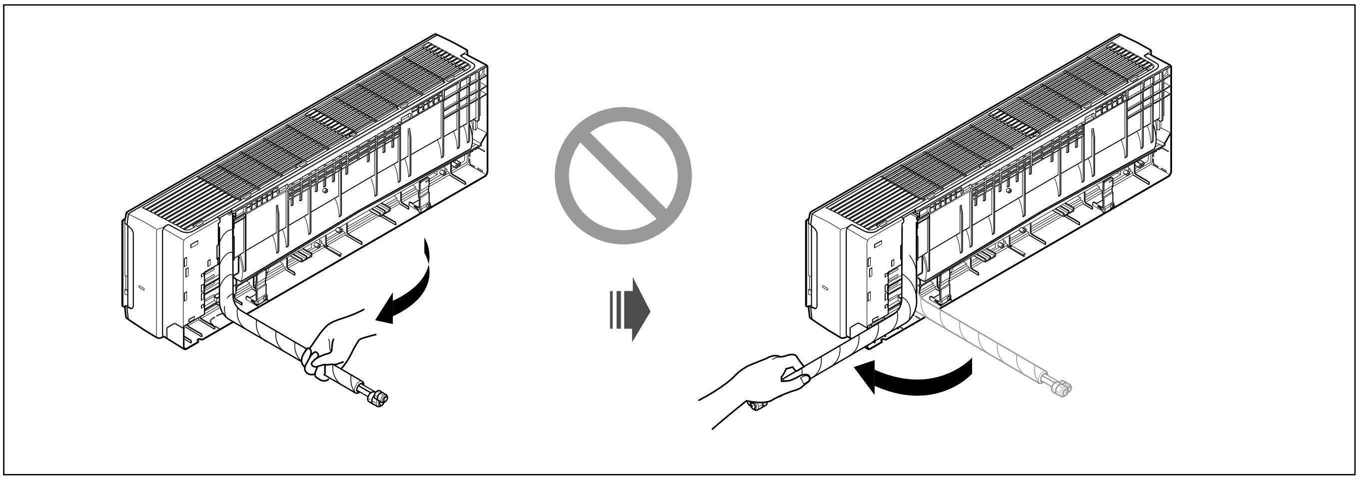
Correct case

• Press on the upper side of clamp and unfold the tubing to downward slowly.



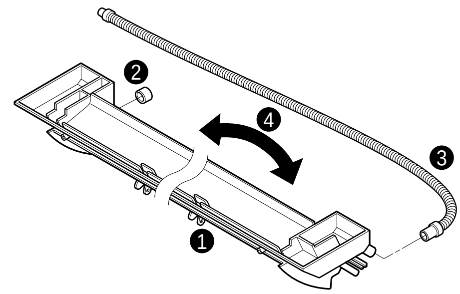
Incorrect case

• Following bending type from right to left may cause damage to the tubing.



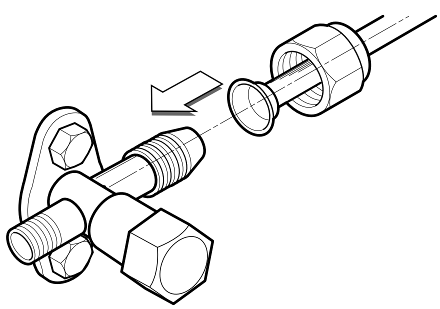
Connection of The Drain Hose

- The drain hose can be connected at two different positions. Use the most convenient position and, if necessary, exchange the position of the drain pan, rubber cap and the drain hose.
  - ❶ Drain pan
  - ❷ Rubber cap
  - ❸ Drain hose
  - ❹ Exchange if necessary
- Remove the drain hose.
- Securely insert both the rubber plug and drain hose into the drain outlets.
  Be sure the rubber the cap is securely fastened so that there is no leakage.



Put a couple drops of refrigerant oil on the face of the flare before assembling taking care not to add any contaminants.

Align the center of the pipings and sufficiently tighten the flare nut by hand.

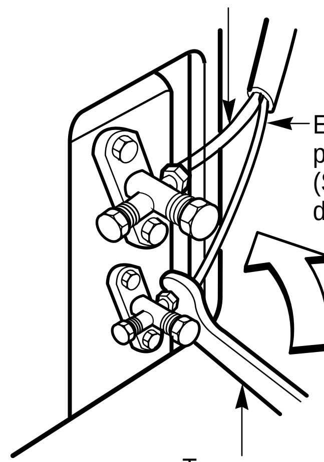


Finally, tighten the flare nut with torque wrench until the wrench clicks.

- When tightening the flare nut with torque wrench, ensure the direction for tightening follows the arrow on the wrench.

Outside diameter		Torque
mm	inch	kgf·cm
Ø6.35	1/4	180~250
Ø9.52	3/8	340~420
Ø12.7	1/2	550~660
Ø15.88	5/8	630~820
Ø19.05	3/4	980~1210

Outdoor unit



Connection of The Cable

1. **Remove the cover control from the unit by loosening the 3 screws.**
2. **Dismount caps on the conduit panel.**
3. **Temporarily mount the conduit tubes on the conduit panel.**
4. **Properly connect both the power supply and low voltage lines to the corresponding terminals on the terminal block.**
5. **Ground the unit in accordance with local codes.**
6. **Be sure to size each wire allowing several inches longer than the required length for wiring.**
7. **Use lock nuts to secure the conduit tubes.**

NOTICE

Connector trade size for this unit is 1/2" for instructions on connecting depending on the wire type you are using.

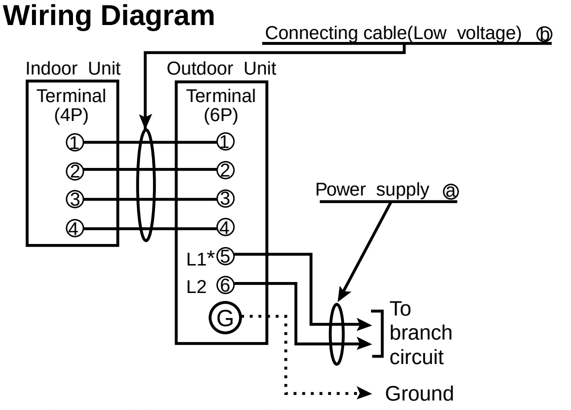
⚠ CAUTION

- **Be sure to comply with local codes while running the wire from the indoor unit to the outdoor unit(size of wire and wiring method, etc).**
- **Every wire must be connected firmly.**
- **No wire should be allowed to touch refrigerant tubing, the compressor or any moving parts.**

Power Supply

Model	Power source	AWG(MIN.)		Fuse or breaker Capacity
		ⓐ	ⓑ	
12k	1ø, 115V	14	18	20A

Wiring Diagram

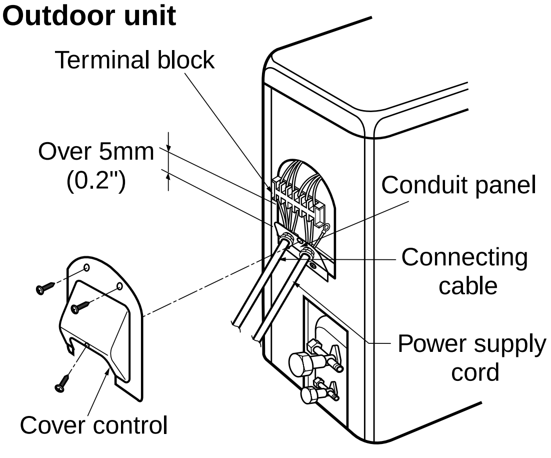


* L1 is neutral for 115V models.

NOTICE

1. **shows field wiring.**
2. **Separately wire the high and low voltage line.**
3. **Use heat-proof electrical wiring capable of withstanding temperatures up to 167°F.**
4. **Use outdoor and waterproof connection cable rated more than 300V for the connection between indoor and outdoor unit. (For example, Type STOW)**

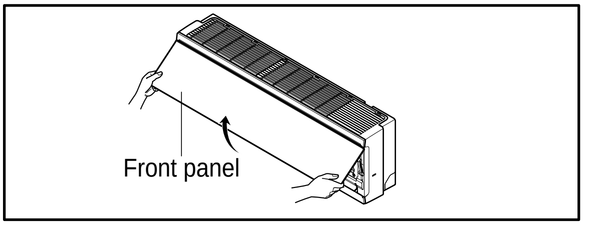
Outdoor unit



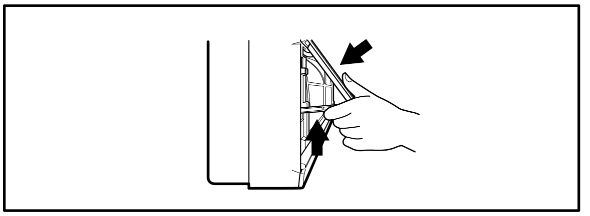
⚠ CAUTION

How to use the front panel

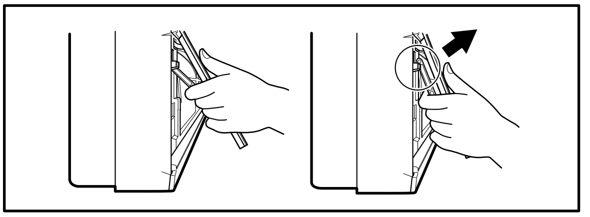
1. Front panel opening
Hold the two ends of the front panel at the bottom and move it upward.



2. Front panel closing
Move the link upward and close the front panel.



3. Front panel removing
Raise the link up to hook hanger and remove front panel forward.



CAUTION

After the confirmation of the above conditions, prepare the wiring as follows:

1) Never fail to have an individual power circuit specifically for the air conditioner. As for the method of wiring, be guided by the circuit diagram posted on the inside of control cover.

2) The screw which fasten the wiring in the casing of electrical fittings are liable to come loose from vibrations to which the unit is subjected during the course of transportation. Check them and make sure that they are all tightly fastened. (If they are loose, it could cause burn-out of the wires.)

3) Specification of power source.

4) Confirm that electrical capacity is sufficient.

5) Confirm that the starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.

6) Confirm that the cable thickness is as specified in the power source specification. (Particularly note the relation between cable length and thickness.

7) Always install an GFCI circuit breaker in a wet or moist area.

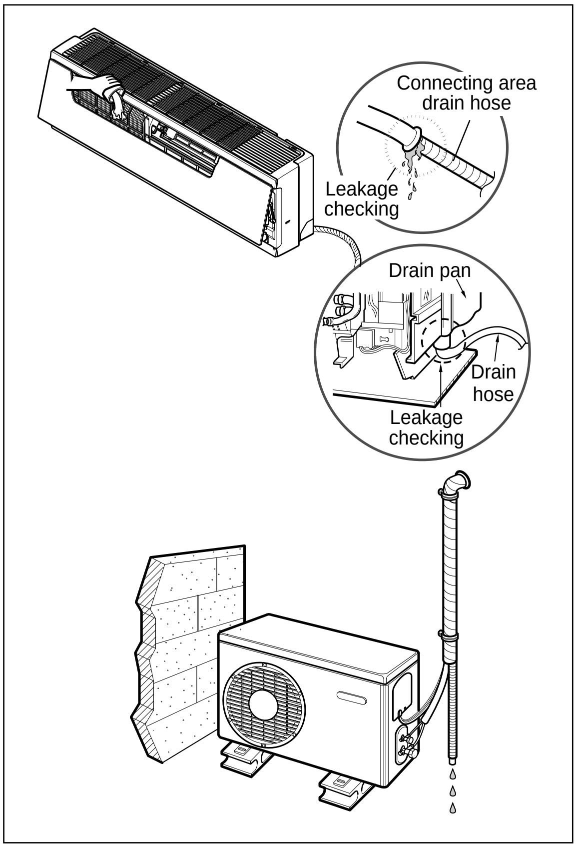
8) The following would be caused by voltage drop.

- Vibration of a magnetic switch, which will damage the contact point, open fuse, disturbance of the normal function of the overload.

9) The means for disconnection from a power supply shall be incorporated in the fixed wiring and have an air gap contact separation of at least 3mm(0.12in) in each active(phase) conductors.

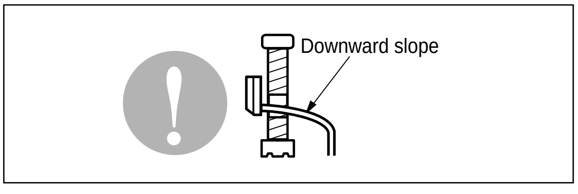
Checking The Drainage

- Pour a glass of water on the drain pan.
- Ensure the water flows through the drain hose of the indoor unit without any leakage and goes out the drain exit.

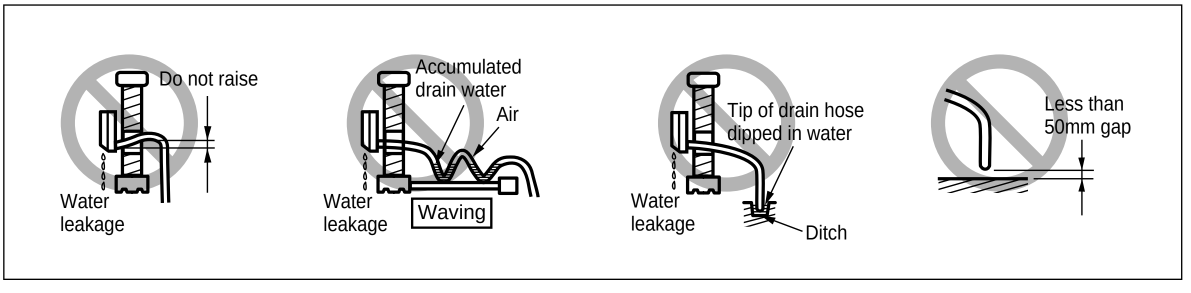


Drain piping

- The drain hose should point downward for easy drain flow.



- Avoid these situations.



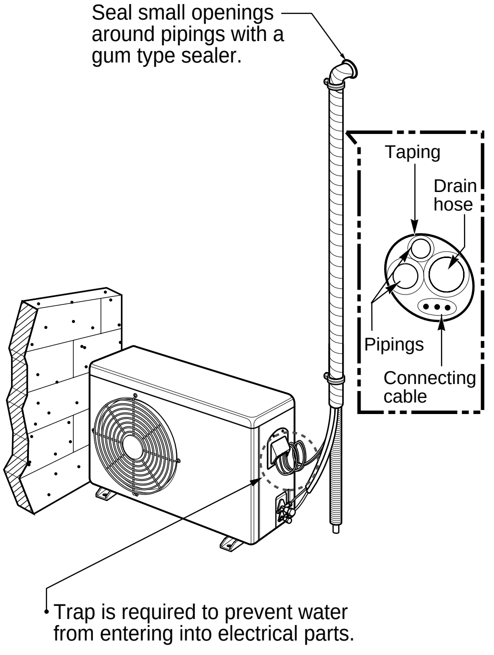
Forming The Piping

Form the piping by wrapping the connecting portion of the indoor unit with insulation material and secure it with two kinds of vinyl tapes.

- If you want to connect an additional drain hose, the end of the drain outlet should be routed above the ground. Secure the drain hose appropriately.

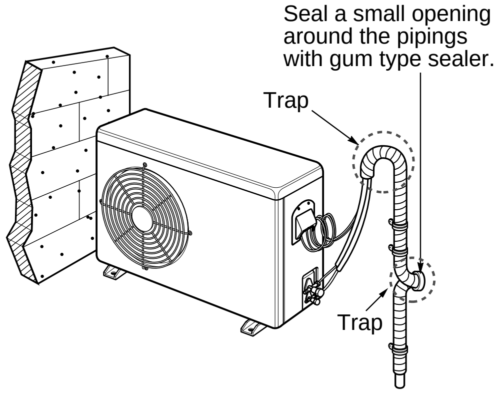
In cases where the outdoor unit is installed below the indoor unit perform the following.

- Tape the piping, drain hose and connecting cable from down to up.
- Secure the tapped piping along the exterior wall using saddle or equivalent.



In cases where the Outdoor unit is installed above the Indoor unit perform the following.

- Tape the piping and connecting cable from down to up.
- Secure the taped piping along the exterior wall. Form a trap to prevent water entering the room.
- Fix the piping onto the wall by saddle or equivalent.



Air Purging

Air and moisture remaining in the refrigerant system have undesirable effects as indicated below.

• Pressure in the system rises.

• Operating current rises.

• Cooling(or heating) efficiency drops.

• Moisture in the refrigerant circuit may freeze and block capillary tubing.

• Water may lead to corrosion of parts in the refrigeration system.

Therefore, the indoor unit and tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any noncondensables and moisture from the system.

Air purging With Vacuum Pump

Preparation

• Check that each tubing(both liquid and gas side tubes) between the indoor and outdoor units have been properly connected and all wiring for the test run has been completed. Remove the service valve caps from both the gas and the liquid side on the outdoor unit. Note that both the liquid and the gas side service valves on the outdoor unit are kept closed at this stage.

Leak test

• Connect the manifold valve(with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

⚠ CAUTION

Be sure to use a manifold valve for air purging. If it is not available, use a stop valve for this purpose. The "Hi" knob of the manifold valve must always be kept close.

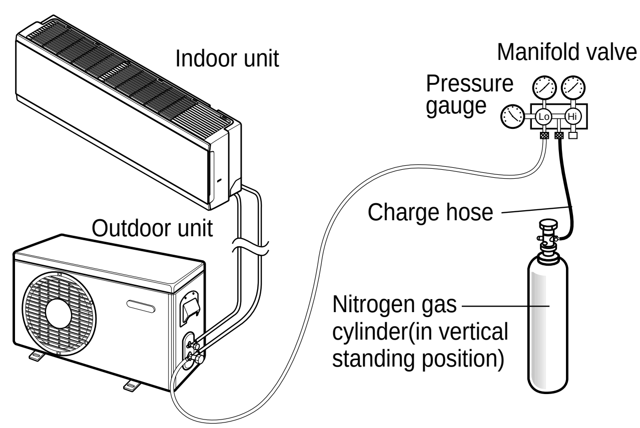
• Pressurize the system to no more than 150 P.S.I.G. with dry nitrogen gas and close the cylinder valve when the gauge reading reached 150 P.S.I.G. Next, test for leaks with liquid soap.

⚠ CAUTION

To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than its bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

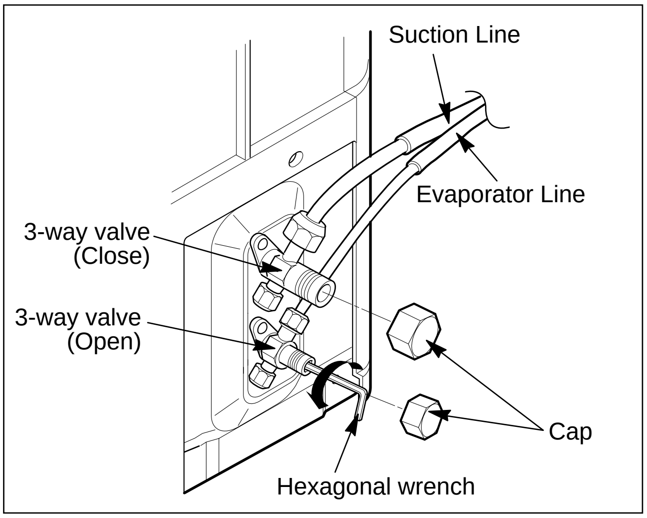
• Do a leak test of all joints of the tubing(both indoor and outdoor) and both gas and liquid side service valves.
Bubbles indicate a leak. Be sure to wipe off the soap with a clean cloth.

• After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.



Soap water method

(1) Remove the caps from the gas side and liquid side valves.
(2) Remove the service-port cap from the gas side valve.
(3) To open the gas side valve turn the valve stem counterclockwise approximately 90°, wait for about 2~3 seconds, and close it.
(4) Apply a soap water or a liquid neutral detergent on the indoor unit connection or outdoor unit connections by a soft brush to check for leakage of the connecting points of the piping.
(5) If bubbles come out, the pipes have leakage.



Evacuation

- Connect the charge hose end described in the preceding steps to the vacuum pump to evacuate the tubing and indoor unit.
  Confirm the "Lo" knob of the manifold valve is open. Then, run the vacuum pump.
  The operation time for evacuation varies with tubing length and capacity of the pump. The following table shows the time required for evacuation.

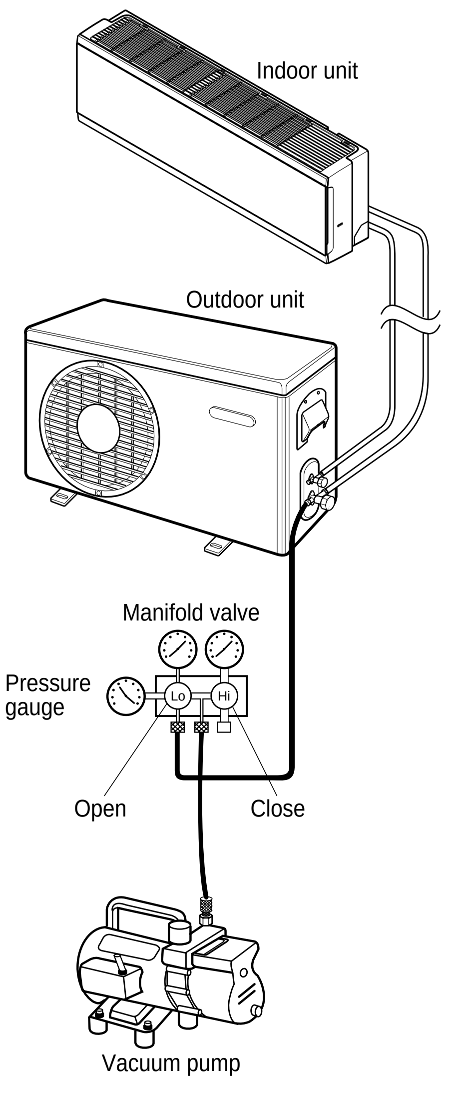
Required time for evacuation when 30 gal/h vacuum pump is used	
If tubing length is less than 10m (33 ft)	if tubing length is longer than 10m (33 ft)
10 min. or more	15 min. or more

- When the desired vacuum is reached, close the "Lo" knob of the manifold valve and stop the vacuum pump.

Finishing the job

- With a service valve wrench, turn the valve stem of liquid side valve counter-clockwise to fully open the valve.
- Turn the valve stem of gas side valve counterclockwise to fully open the valve.
- Loosen the charge hose connected to the gas side service port slightly to release the pressure, then remove the hose.
- Replace the flare nut and its bonnet on the gas side service port and fasten the flare nut securely with an adjustable wrench. This process is very important to prevent leakage from the system.
- Replace the valve caps at both gas and liquid side service valves and fasten them tight.

This completes air purging with a vacuum pump. The air conditioner is now ready to test run.



Charging

■ Each outdoor unit is factory charged (nameplate charge) for the evaporator as well as a 7.5m(25ft) line set. Any time a line set is used either shorter or longer then the nominal 7.5m(25ft) line set length the refrigerant charge has to be adjusted.

■ Whether the line set is made shorter or longer you must adjust the charge based on how many ft of tubing are either added or removed based on 20g(0.22oz) of R-410A per meter(foot).

Capacity (Btu/h)	Pipe Size		Standard Length m(ft)	Max. Elevation Ⓑ m(ft)	Max. length Ⓐ m(ft)	Additional Refrigerant g/m(oz/ft)
	Suction	Evap				
12k	Ø12.7(1/2")	Ø6.35(1/4")	7.5(25)	7.5(25)	15(49)	20(0.22)

Example: A 30ft line set is used
5 additional ft X 0.22 ounce per foot= add 1.1 ounces of R-410A

Important:

If you are ever uncertain of the unit charge, reclaim, evacuate and weigh in the correct charge using the unit nameplate charge adjusting for line sets longer or shorter than 7.5m(25ft).

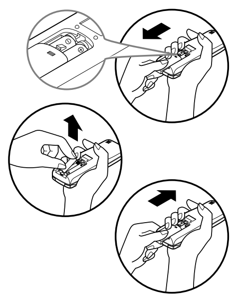
⚠ CAUTION

Confirm the refrigerant R-410A. Use manifold gauge and hose for R-410A.

Test Running

1. Check that all tubing and wiring have been properly connected.
2. Check that the gas and liquid side service valves are fully open.

Prepare remote control



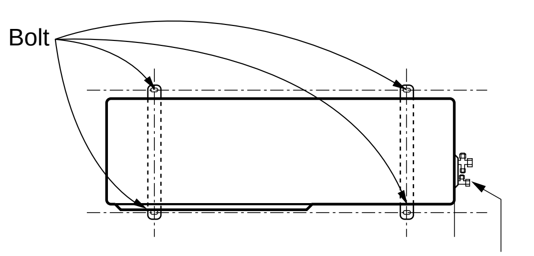
1. Remove the battery cover by pulling it according to the arrow direction.
2. Insert new batteries making sure that the (+) and (–) of battery are installed correctly.
3. Reattach the cover by pushing it back into position.

NOTE:

- Use 2 AAA(1.5volt) batteries. Do not use rechargeable batteries.
- Remove the batteries from the remote control if the system is not going to be used for a long time.

Settlement of outdoor unit

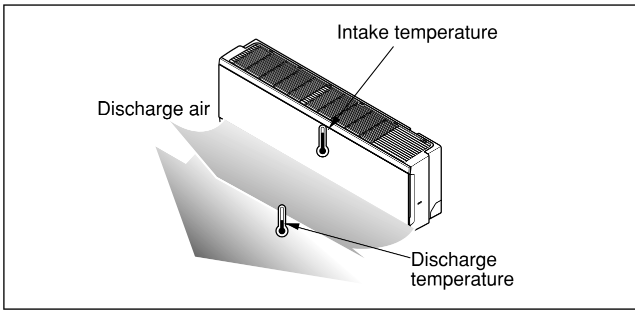
- ■ Anchor the outdoor unit with a bolt and nut(ø10mm(0.39in) tightly and horizontally on a concrete or rigid mount.
- ■ When installing on the wall, roof or rooftop, anchor the mounting base securely with a nail or wire assuming the influence of wind and earthquake.
- ■ In the case when the vibration of the unit is conveyed to the hose, secure the unit with an anti-vibration rubber.



Evaluation of the performance

Operate unit for 15~20 minutes, then check the system refrigerant charge:

1. Measure the pressure of the gas side service valve.
2. Measure the temperature of the intake and discharge of air.
3. Ensure the difference between the intake temperature and the discharge is more than 46.4°F(8°C) (Cooling) or (Heating).



4. For reference; the gas side pressure of optimum condition is as below.(Cooling)

Outside ambient TEMP.	The pressure of the gas side service valve
95°F(35°C)	8.5~9.5kg/cm^2 G(120~135 P.S.I.G.)

NOTE: If the actual pressure are higher than shown, the system is most likely overcharged, and charge should be removed. If the actual pressure are lower than shown, the system is most likely undercharged, and charge should be added.

The air conditioner is now ready for use.

PUMP DOWN

This is performed when the unit is to be relocated or the refrigerant circuit is serviced.
Pump Down means collecting all refrigerant in the outdoor unit without loss of refrigerant.

CAUTION:
Be sure to perform Pump Down procedure with the unit cooling mode.

Pump Down Procedure

1. Connect a low-pressure gauge manifold hose to the charge port on the gas side service valve.
2. Open the gas side service valve halfway and purge the air from the manifold hose using the refrigerant gas.
3. Close the liquid side service valve(all the way in).
4. Turn on the unit's operating switch and start the cooling operation.
5. When the low-pressure gauge reading becomes 1 to 0.5kg/cm^2 G(14.2 to 7.1 P.S.I.G.), fully close the gas side valve stem and then quickly turn off the unit. At that time, Pump Down has been completed and all refrigerant will have been collected in the outdoor unit.

Operation

Function of Controls

• **DISPLAY**

1) C/O Model

Operation Indicator

- ON while in appliance operation, OFF while in appliance pause.
- Flashing while in disconnection or short in Thermistor. (3 sec off / 0.5 sec on)

Timer Indicator

- ON while in timer mode (on/off), OFF when timer mode is completed or canceled.

Comp. Running Incidator

- While in appliance operation, ON while in outdoor unit compressor running, OFF while in compressor off.

2) H/P Model

Operation Indicator

- ON while in appliance operation, OFF while in appliance pause.
- Flashing while in disconnection or short in Thermistor. (3 sec off / 0.5 sec on)

Timer Indicator

- ON while in timer mode (on/off), OFF when timer mode is completed or canceled.

Defrost Indicator

- OFF except when hot start during heating mode operation or while in defrost control.

■ Cooling Mode Operation

- When the intake air temperature reaches 0.5°C below the setting temp, the compressor and the outdoor fan stop.
- When it reaches 0.5°C above the setting temp, they start to operate again.

Compressor ON Temp	➲ Setting Temp+0.5°C
Compressor OFF Temp	➲ Setting Temp-0.5°C

- While in compressor running, operating with the airflow speed set by the remote control. While in compressor not running, operating with the low airflow speed regardless of the setting.

■ Healthy Dehumidification Mode

- When the dehumidification operation input by the remote control is received, the intake air temperature is detected and the setting temp is automatically set according to the intake air temperature.

26°C ≤ Intake Air Temp	➲ 25°C
24°C ≤ Intake Air Temp<26°C	➲ Intake Air Temp-1°C
18°C ≤ Intake Air Temp<24°C	➲ Intake Air Temp-0.5°C
Intake Air Temp<18°C	➲ 18°C

- While in compressor off, the indoor fan repeats low airflow speed and pause.
- While the intake air temp is between compressor on temp. and compressor off temp., 10-min dehumidification operation and 4-min compressor off repeat.
  Compressor ON Temp. ➲ Setting Temp+0.5°C
  Compressor OFF Temp. ➲ Setting Temp-0.5°C
- In 10-min dehumidification operation, the indoor fan operates with the low airflow speed.

■ Heating Mode Operation

- When the intake air temp reaches +3°C above the setting temp, the compressor is turned off. When reaches the setting temp, the compressor is turned on.
  Compressor ON Temp. ➲ Setting Temp.
  Compressor OFF Temp. ➲ Setting Temp.+3°C
- While in compressor on, the indoor fan is off when the indoor pipe temp. is below 20°C, when above 28°C , it operates with the low or setting airflow speed. When the indoor pipe temp is between 20°C and 28°C, it operates with Super-Low(while in sleep mode, with the medium airflow speed).
- While in compressor off, the indoor fan is off when the indoor pipe temp is below 33°C, when above 35°C , it operates with the low airflow speed.
- If overloaded while in heating mode operation, in order to prevent the compressor from OLP operation, the outdoor fan is turned on/off according to the indoor pipe temp.
- While in defrost control, both of the indoor and outdoor fans are turned off.

■ Defrost Control

- While in heating mode operation in order to protect the evaporator pipe of the outdoor unit from freezing, reversed to cooling cycle to defrost the evaporator pipe of the outdoor unit.
- After 40 min heating mode operation, at 4 min interval, whether to carry out defrost control or not and the time of defrost control are determined according to the following conditions.

1) While in heating mode operation, the maximum of the indoor pipe temperature is measured and it is compared with the present indoor pipe temperature to get the difference of the indoor pipe temperatures (=the maximum temperature of indoor pipe ? the present temperature of indoor pipe), according to which, whether to carry out defrost control or not is determined.
2) According to the need of defrost control shown above and the elapsed time of heating mode operation at that moment, the defrost control time is determined.
3) When the determined time of defrost control is below 7 min, heating mode operation continues without carrying out defrost control. According to the procedure stated above, the determination is made again. When the defrost control time is 7 min or longer, defrost control is then carried out.

- While in defrost control, the minimum temp of the indoor pipe is measured and it is compared with the present temp of the indoor pipe to get the difference of the indoor pipe temperatures (=the present temperature of the indoor pipe ? the minimum temperature of the indoor pipe). When the difference is 5°C or higher, defrost control is completed and heating mode operation is carried out.
- While in defrost control, if the defrost time determined before the start of defrost control is completed, defrost control stops and heating mode operation is carried out regardless of the above condition.
- When the indoor pipe temp is 42°C or above, defrost control is not carried out even if the condition is one of the defrost conditions above.
- While in defrost control, the compressor is on and the indoor fan, the outdoor fan, and the 4 way valve are off.

■ Airflow Speed Selection

- The airflow speed of the indoor fan is set to high, medium, low, or chaos (auto) by the input of the airflow speed selection key on the remote control.

■ Sleep Timer Operation

- When the sleep time is reached after <1,2,3,4,5,6,7,0(cancel) hr> is input by the remote control while in appliance operation, the operation of the appliance stops.
- While the appliance is on pause, the sleep timer mode cannot be input.
- While in cooling mode operation, 30 min later since the start of the sleep timer, the setting temperature increases by 1°C. After another 30 min elapse, it increases by 1°C again.
- When the sleep timer mode is input while in cooling cycle mode, the airflow speed of the indoor fan is set to the low.
- When the sleep timer mode is input while in heating cycle mode, the airflow speed of the indoor fan is set to the medium.

■ Chaos Natural Wind Mode

- When the Chaos Natural Wind mode is selected and then operated, the high, medium, or low speed of the airflow mode is operated for 2~15 sec. randomly by the Chaos Simulation.

■ Jet Cool Mode Operation (C/O Model)

- If the Jet Cool key is input at any operation mode while in appliance operation, the Jet Cool mode operates.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

■ Jet Cool Mode Operation (H/P Model)

- While in heating mode or Fuzzy operation, the Jet Cool key cannot be input. When it is input while in the other mode operation (cooling, dehumidification, ventilation), the Jet Cool mode is operated.
- In the Jet Cool mode, the indoor fan is operated at super-high speed for 30 min at cooling mode operation.
- In the Jet Cool mode operation, the room temperature is controlled to the setting temperature, 18°C.
- When the sleep timer mode is input while in the Jet Cool mode operation, the Jet Cool mode has the priority.
- When the Jet Cool key is input, the upper/lower vanes are reset to those of the initial cooling mode and then operated in order that the air outflow could reach further.

■ Forced operation

- Operation procedures when the remote control can't be used.
- The operation will be started if the power button is pressed.
- If you want to stop operation, re-press the button.

	Cooling Model	Heat pump Model		
		Room Temp. ≥ 24°C(75.2°F)	21°C(69.8°F) ≤ Room Temp. < 24°C(75.2°F)	Room Temp. < 21°C(69.8°F)
Operating mode	Cooling	Cooling	Healthy Dehumidification	Heating
Indoor FAN Speed	High	High	High	High
Setting Temperature	22°C(71.6°F)	22°C(71.6°F)	23°C(73.4°F)	24°C(75.2°F)

- While in forced operation, the key input by the remote control has no effect and the buzzer sounds 10 times to indicate the forced operation.

■ Test operation

- During the TEST OPERATION, the unit operates in cooling mode at high speed fan, regardless of room temperature and resets in 18±1 minutes.
- During test operation, if remote controller signal is received, the unit operates as remote controller sets.
  If you want to use this operation, open the front panel upward and Press the power button let it be pressed for about 3 seconds.
- If you want to stop the operation, re-press the button.

■ Auto restart

- In case the power comes on again after a power failure, Auto Restarting Operation is the function to operate procedures automatically to the previous operating conditions.

■ Protection of the evaporator pipe from frosting

- If the indoor pipe temp is below 0°C in 7 min. after the compressor operates without any pause while in cooling cycle operation mode, the compressor and the outdoor fan are turned off in order to protect the indoor evaporator pipe from frosting.
- When the indoor pipe temp is 7°C or higher after 3 min. pause of the compressor, the compressor and the outdoor fan is turned on according to the condition of the room temperature.

■ Buzzer Sounding operation

- When the appliance-operation key is input by the remote control, the short "beep-beep-" sounds.
- When the appliance-pause key is input by the remote control, the long "beep—" sounds.

Display Function

1. Heating Model

Operation Indicator

- Cooling, Soft Dry, Fan, Heating

Deicer Indicator

- Hot-start, Deice

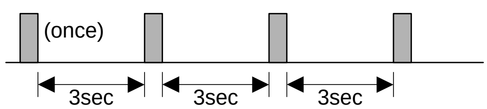
2. Cooling Model

Operation Indicator

- Cooling, Soft Dry, Fan

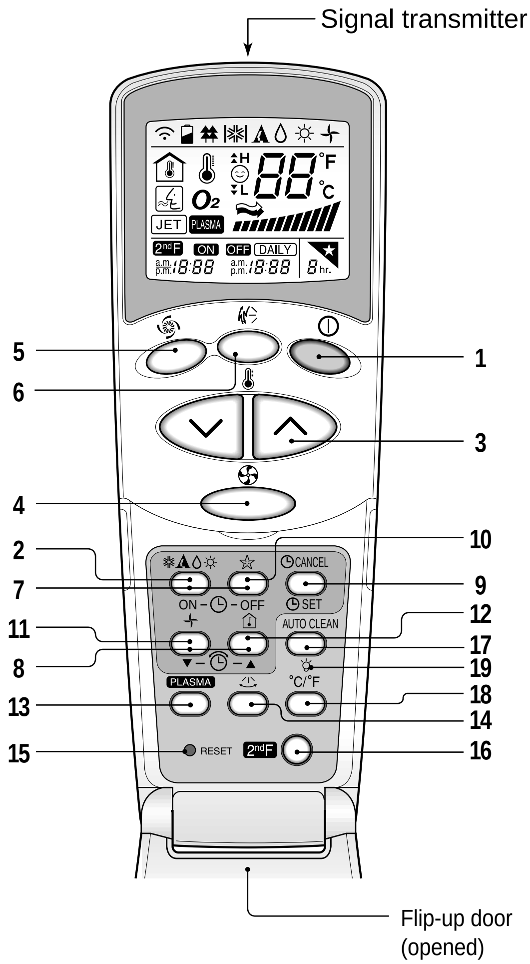
Compressor on Indicator

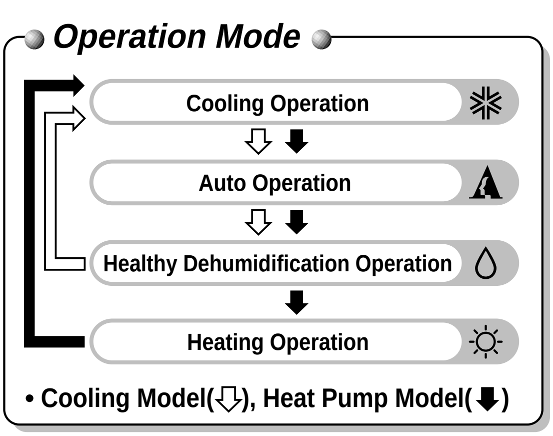
Self-diagnosis Function

Error Code	Error Display LED (Indoor body operation LED)	Error contents	SVC check point
1		• Indoor room temperature thermistor open/short • Indoor pipe temperature thermistor open/short.	• Indoor Thermistor assembly check

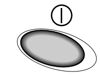
Remote Control Operations

The controls will look like the following.





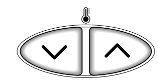
1. START/STOP BUTTON
Operation starts when this button is pressed and stops when the button is pressed again.



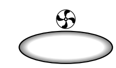
2. OPERATION MODE SELECTION BUTTON
Used to select the operation mode.



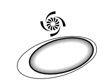
3. ROOM TEMPERATURE SETTING BUTTONS
Used to select the room temperature.



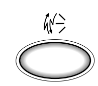
4. INDOOR FAN SPEED SELECTOR
Used to select fan speed in four steps low, medium, high and CHAOS.



5. JET COOL
Used to start or stop the speed cooling. (speed cooling operates super high fan speed in cooling mode.)



6. CHAOS SWING BUTTON
Used to stop or start louver movement and set the desired up/down airflow direction.



7. ON/OFF TIMER BUTTONS
Used to set the time of starting and stopping operation.

8. TIME SETTING BUTTONS
Used to adjust the time.

9. TIMER SET/CANCEL BUTTON
Used to set the timer when the desired time is obtained and to cancel the Timer operation.

10. SLEEP MODE AUTO BUTTON
Used to set Sleep Mode Auto operation.

11. AIR CIRCULATION BUTTON
Used to circulate the room air without cooling or heating.

12. ROOM TEMPERATURE CHECKING BUTTON
Used to check the room temperature.

13. NEO PLASMA(OPTIONAL)
Used to start or stop the plasma-purification function.

14. HORIZONTAL AIRFLOW DIRECTION CONTROL BUTTON (OPTIONAL)
Used to set the desired horizontal airflow direction.

15. RESET BUTTON
Used prior to resetting time.

16. 2nd F Button
Used prior to using modes printed in blue at the bottom of buttons.

17. AUTO CLEAN (OPTIONAL)
Used to set Auto Clean mode.

18. ˚C TO ˚F SWITCHING BUTTON
Used to switch temperature reading from Centigrade to Fahrenheit.

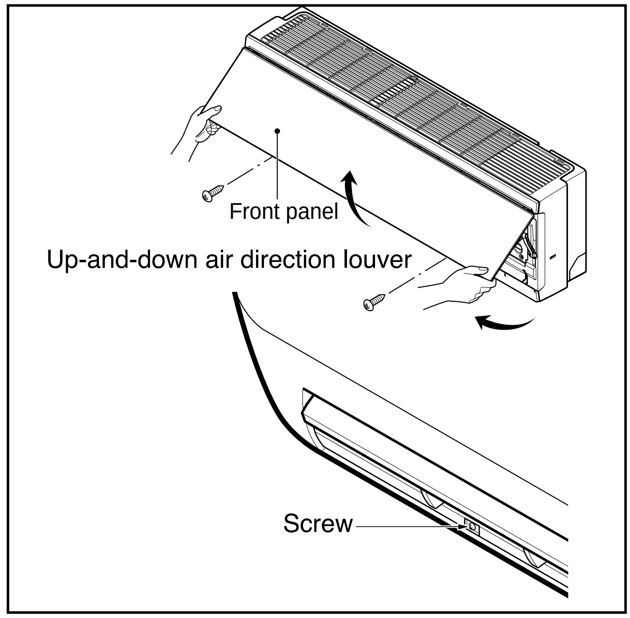
19. LCD LUMINOSITY BUTTON(OPTIONAL)
Used to adjust LCD luminosity.

Disassembly

Indoor Unit

⚠ WARNING

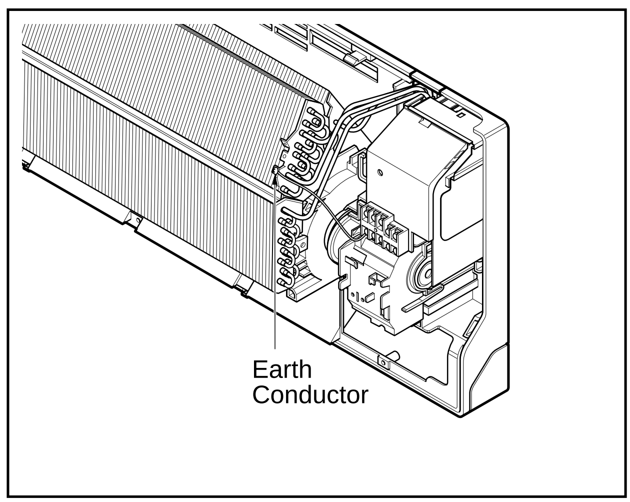
Disconnect the unit from power supply before making any checks.
Be sure the power switch is set to “OFF”.



To remove the Grille from the Chassis.

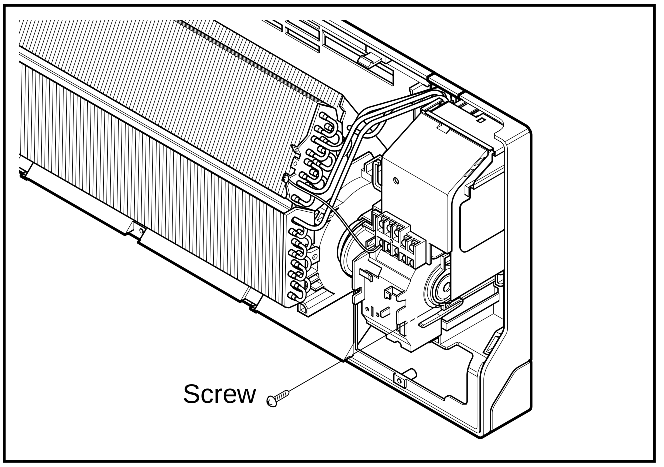
- Open the front panel as shown, and Remove the Securing screws.
- Set the up-and-down air discharge louver to open position (horizontally) by finger pressure.
- Remove the securing screws.
- To remove the Grille, pull the lower left and right side of the grille toward you (slightly tilted) and lift it straight upward.

1. Before removing the control box, be sure to take out the wire screwed at the other end.



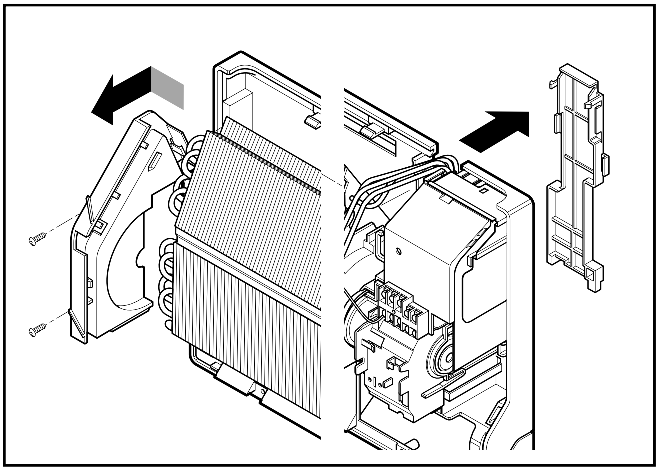
2. To remove the Control Box.

- Remove securing screws.
- Pull the control box out from the chassis carefully.



3. To remove the Discharge Grille.

- Unhook the discharge grille and pull the discharge grille out from the chassis carefully.

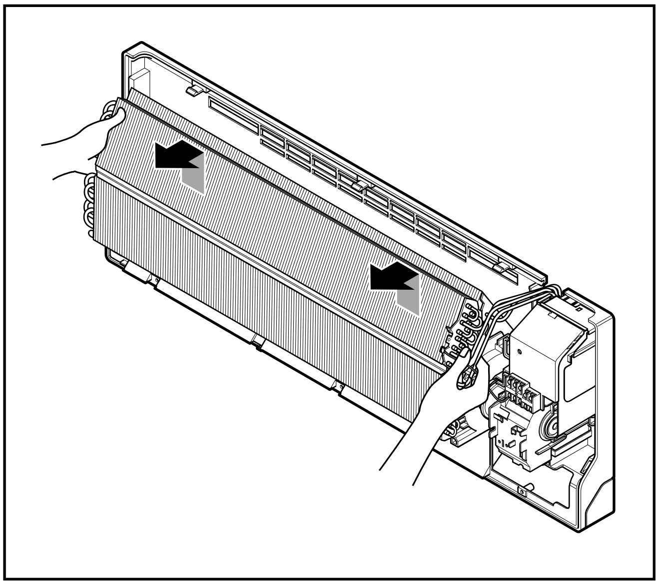


4. To remove the Evaporator.

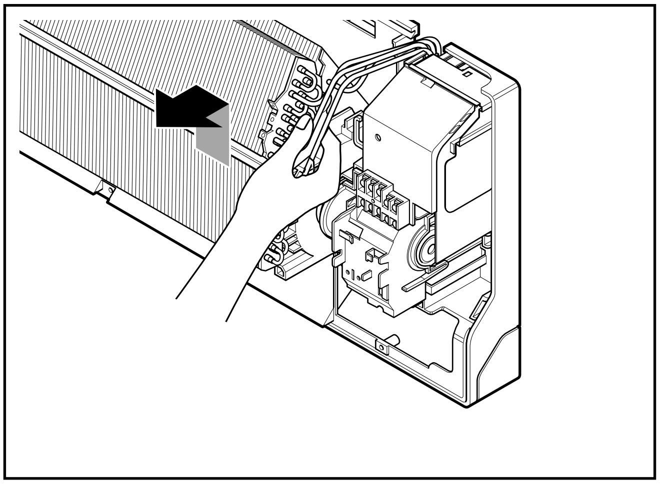
- Remove 3 screws securing the evaporator(at the left 2EA in the Eva Holder, at the right 1EA).

⚠ CAUTION

- When repair, do not damage the Caution label.

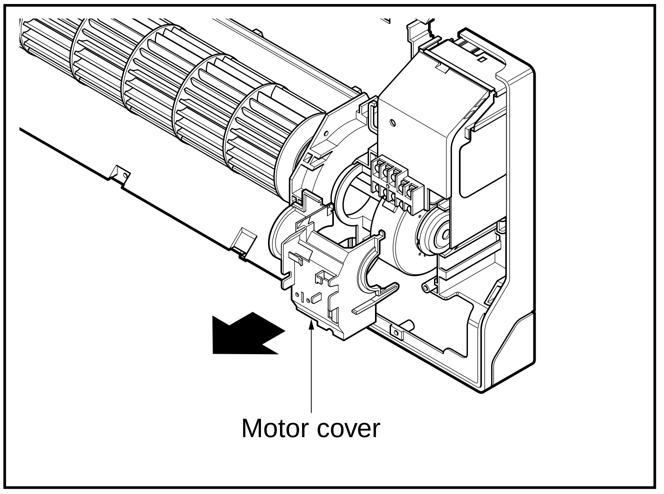


- Unhook the tab on the right inside of the chassis at the same time, slightly pull the evaporator toward you until the tab is clear of the slot.



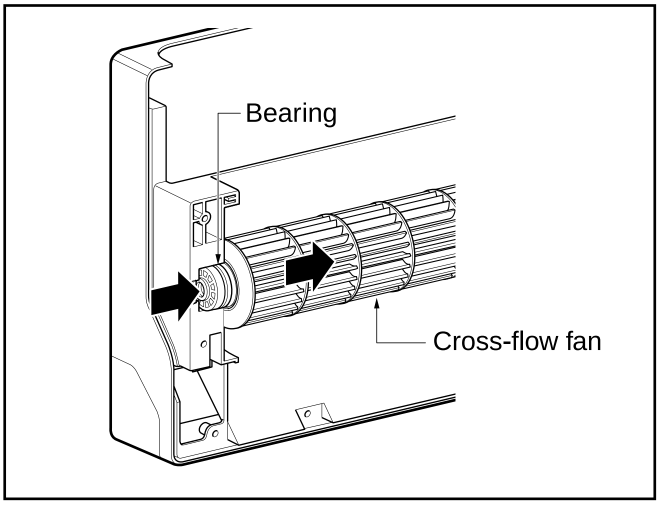
5. To remove the Motor Cover

- Remove 2 securing screw.
- Pull the motor cover out from the chassis carefully.



6. To remove the Cross-Flow Fan

- Loosen the screw securing the cross-flow fan to the fan motor (do not remove).
- Lift up the right side of the cross-flow fan and the fan motor, separate the fan motor from the cross-flow fan.

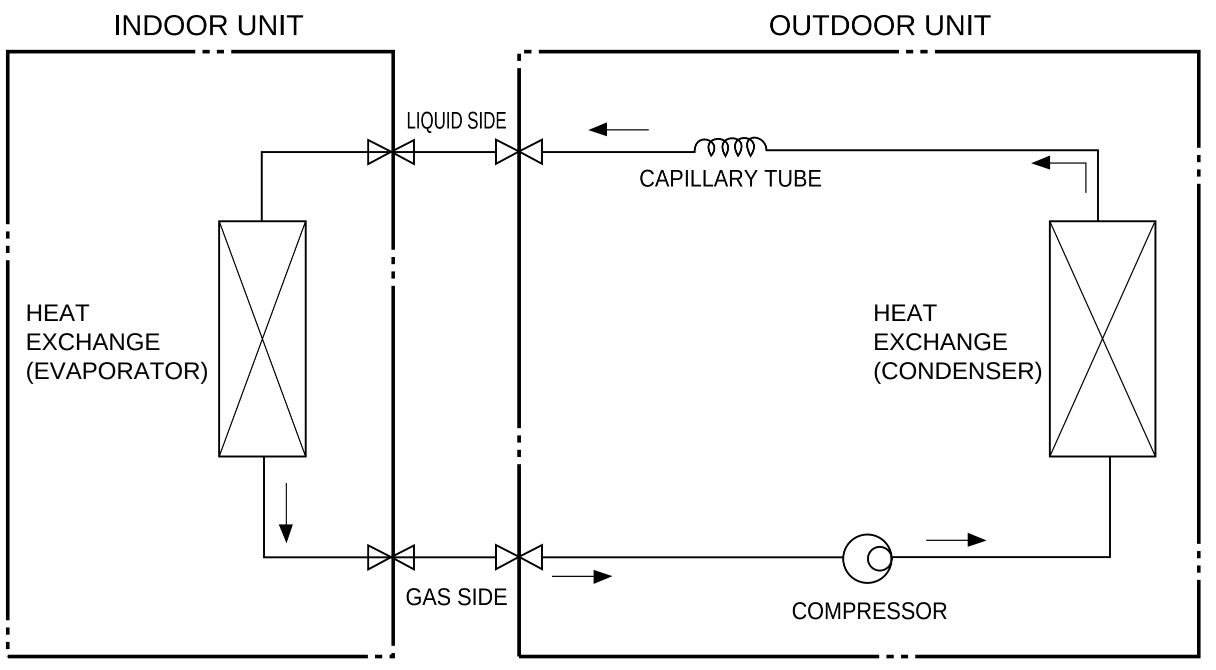


- Remove the left end of the cross-flow fan from the self-aligning bearing.

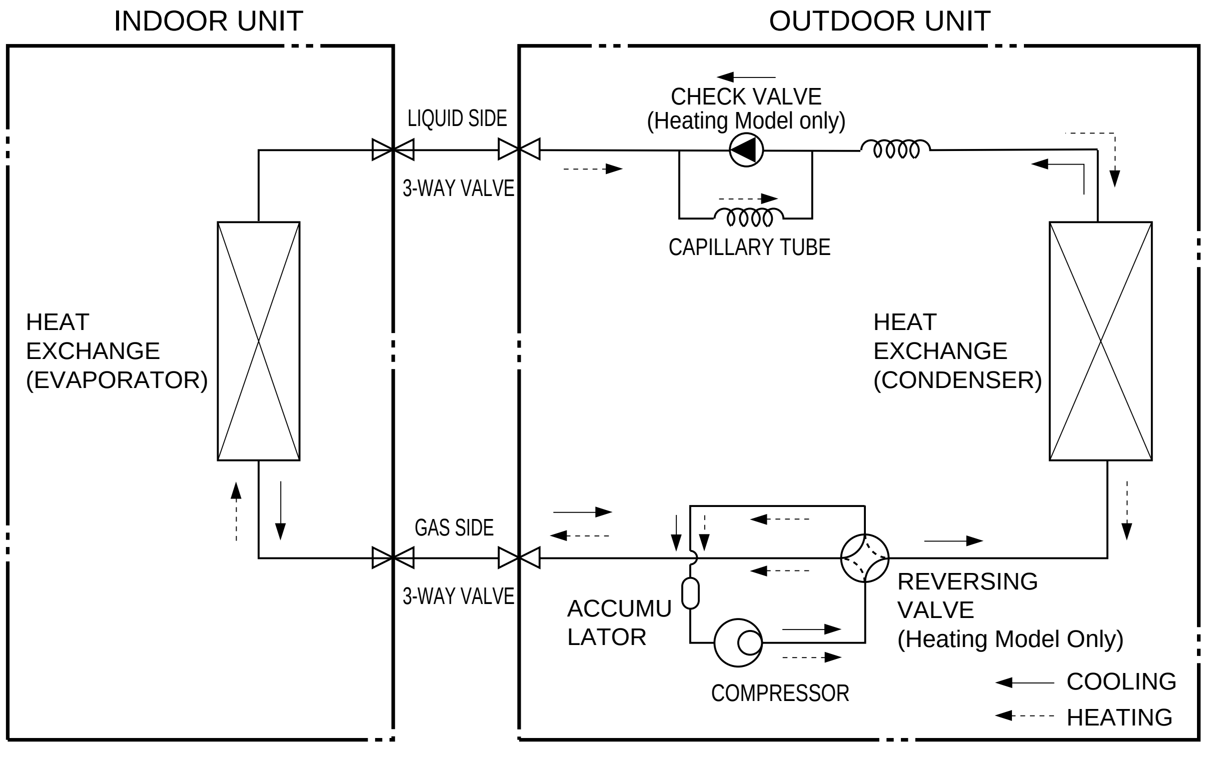
Troubleshooting Guide

Refrigeration Cycle Diagram

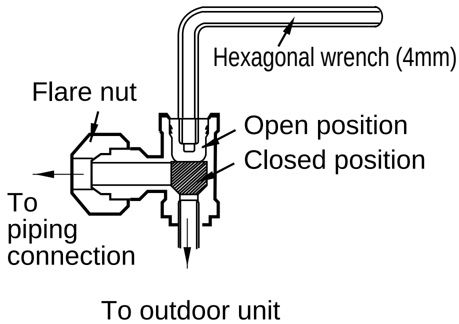
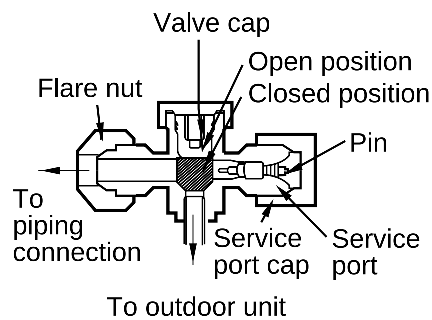
(1) Cooling Only Models



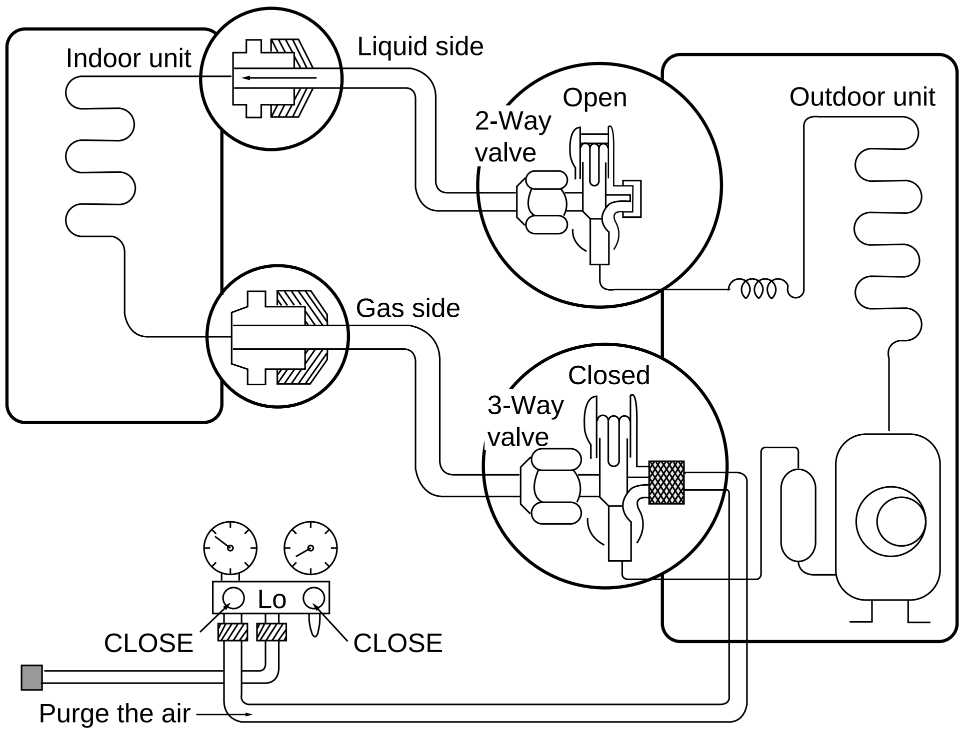
(2) Cooling & Heating Models



2-way, 3-way Valve

		2-way Valve (Liquid Side)	3-way Valve (Gas Side)	
				
	Works	Shaft position	Shaft position	Service port
	Shipping	Closed (with valve cap)	Closed (with valve cap)	Closed (with cap)
1.	Air purging (Installation)	Open (counter-clockwise)	Closed (clockwise)	Open (push-pin or with vacumm pump)
	Operation	Open (with valve cap)	Open (with valve cap)	Closed (with cap)
2.	Pumping down (Transfering)	Closed (clockwise)	Open (counter-clockwise)	Open (connected manifold gauge)
3.	Evacuation (Servicing)	Open	Open	Open (with charging cylinder)
4.	Gas charging (Servicing)	Open	Open	Open (with charging cylinder)
5.	Pressure check (Servicing)	Open	Open	Open (with charging cylinder)
6.	Gas releasing (Servicing)	Open	Open	Open (with charging cylinder)

Pumping Down



• Procedure

(1) Confirm that both the 2-way and 3-way valves are set to the open position.
- Remove the valve stem caps and confirm that the valve stems are in the raised position.
- Be sure to use a hexagonal wrench to operate the valve stems.

(2) Operate the unit for 10 to 15 minutes.

(3) Stop operation and wait for 3 minutes, then connect the charge set to the service port of the 3-way valve.
- Connect the charge hose with the push pin to the service port.

(4) Air purging of the charge hose.
- Open the low-pressure valve on the charge set slightly to air purge from the charge hose.

(5) Set the 2-way valve to the closed position.

(6) Operate the air conditioner at the cooling cycle and stop it when the gauge indicates 1kg/cm^{2}g.

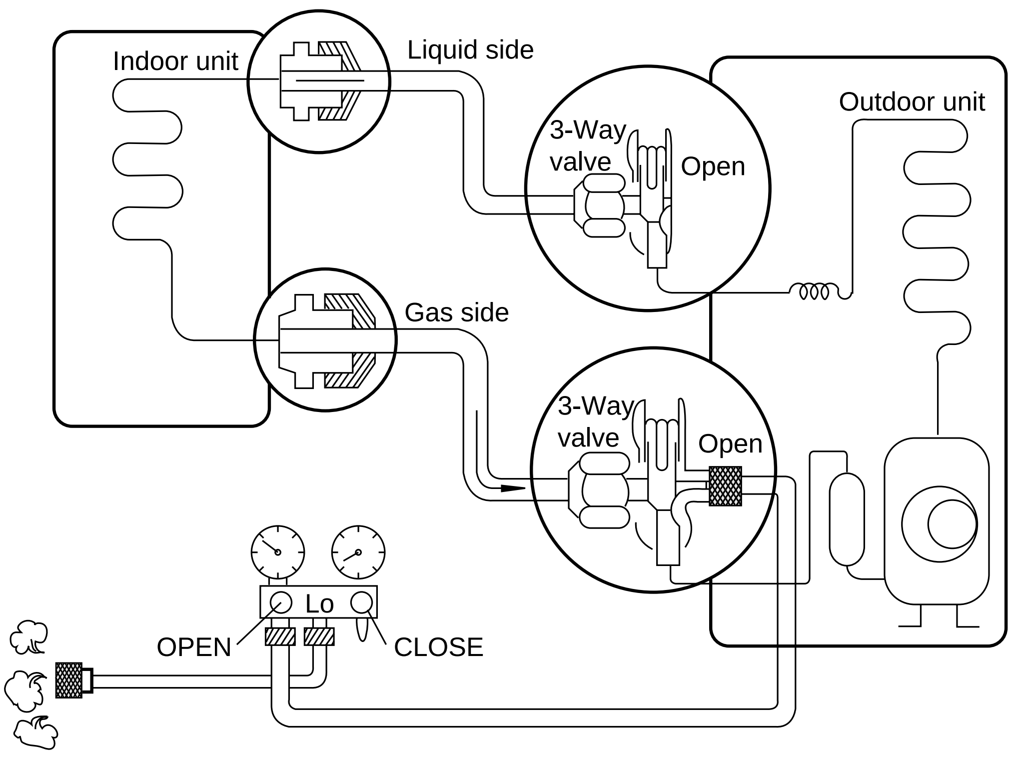
(7) Immediately set the 3-way valve to the closed position.
- Do this quickly so that the gauge ends up indicating 3 to 5kg/cm^{2}g.

(8) Disconnect the charge set, and mount the 2-way and 3-way valve's stem nuts and the service port nut.
- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

⚠ CAUTION

Do not use the existing charge set for R-22. It is necessary to use new charge set for R-410A. The pressure of R-410A is 1.6 times higher than that of R-22. Thus, the high pressure side gauge of charge set should be used higher pressure gauge of 50kg/cm^2 range.

Balance Refrigerant of the 3-way Valve
(Gas leakage)



• Procedure

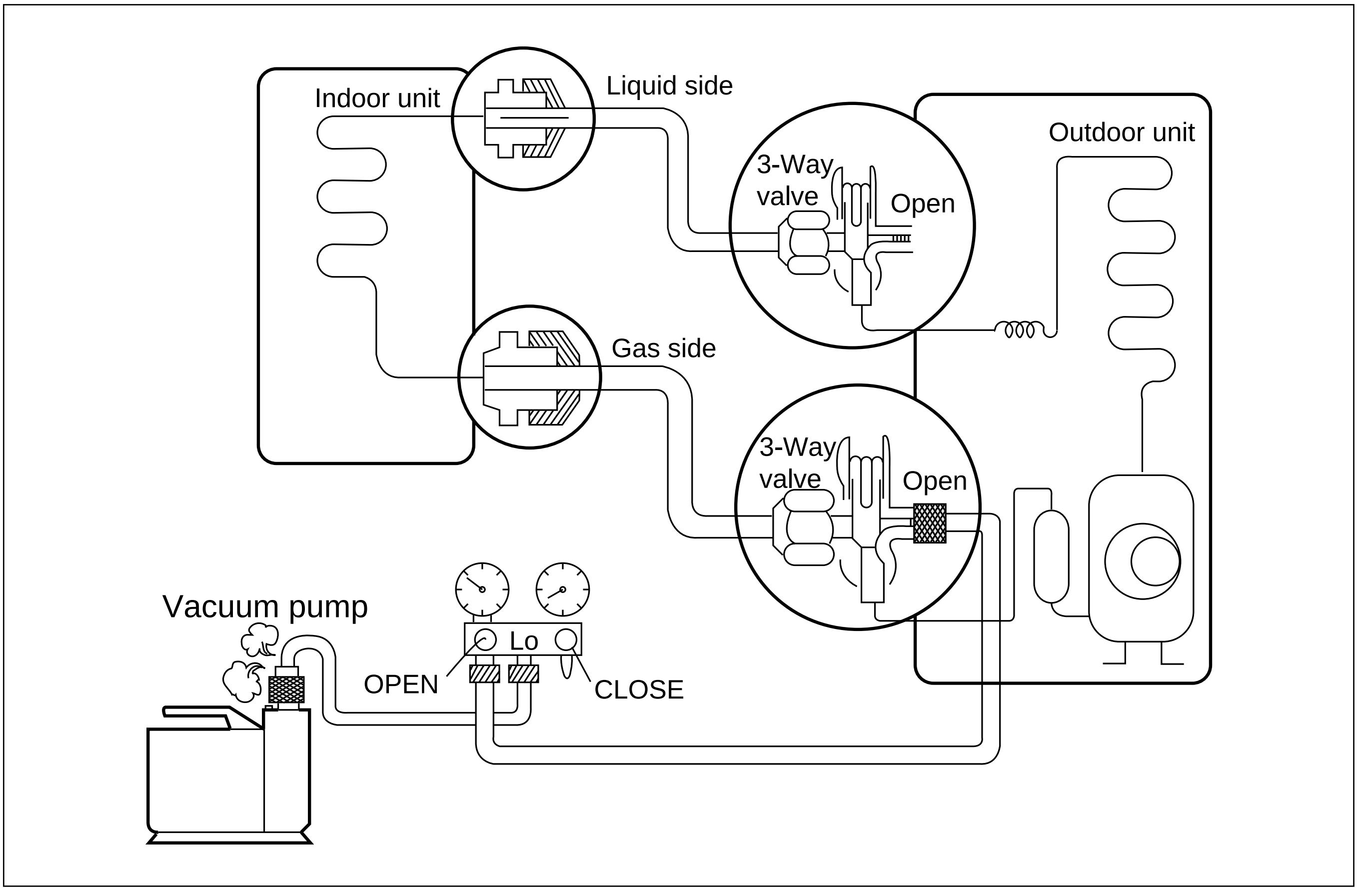
(1) Confirm that both the 2-way and 3-way valves are set to the back seat.

(2) Connect the charge set to the 3-way valve's port.
- Leave the valve on the charge set closed.
- Connect the charge hose to the service port.

(3) Open the valve (Lo side) on the charge set and discharge the refrigerant until the gauge indicates 0 kg/cm²G.
- If there is no air in the refrigerant cycle (the pressure when the air conditioner is not running is higher than 1 kg/cm²G), discharge the refrigerant until the gauge indicates 0.5 to 1 kg/cm²G. if this is the case, it will not be necessary to apply a evacuatin.
- Discharge the refrigerant gradually; if it is discharged too suddenly, the refrigeration oil will also be discharged.

Evacuation

(All amount of refrigerant leaked)



• **Procedure**

(1) Connect the vacuum pump to the center hose of charge set center hose

(2) Evacuation for approximately one hour.
– Confirm that the gauge needle has moved toward -76 cmHg (vacuum of 4 mmHg or less).

(3) Close the valve (Lo side) on the charge set, turn off the vacuum pump, and confirm that the gauge needle does not move (approxima-tely 5 minutes after turning off the vacuum pump).

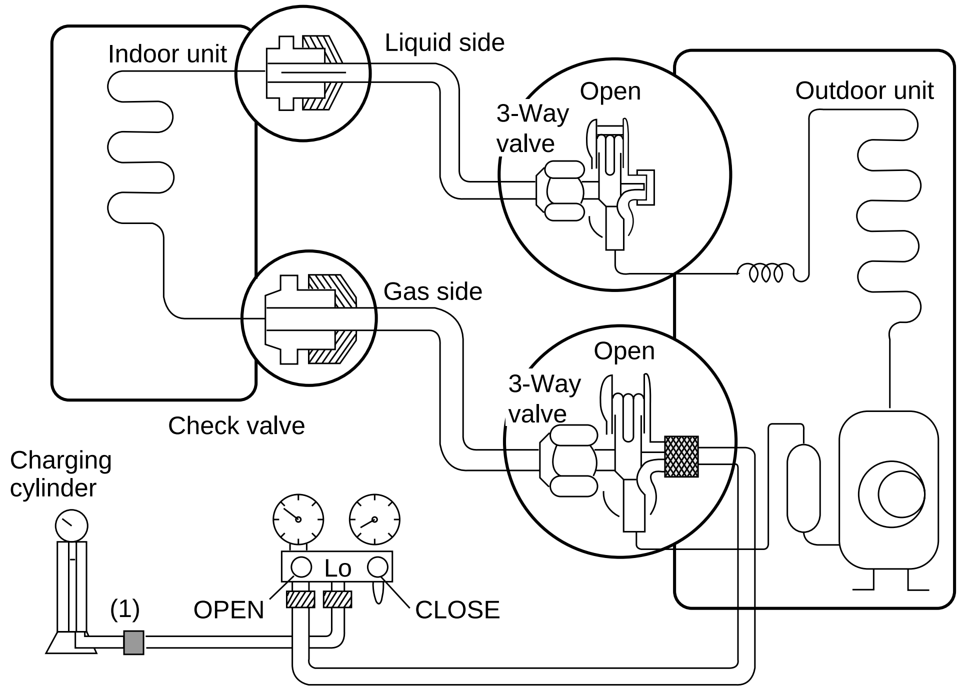
(4) Disconnect the charge hose from the vacuum pump.
– Vacuum pump oil.
If the vacuum pump oil becomes dirty or depleted, replenish as needed.

⚠ CAUTION

Use vacuum pump equipped with check value applied to be prevented from flowing backward.

Gas Charging

(After Evacuation)



• Procedure

(1) Connect the charge hose to the charging cylinder.

– Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder.

– If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.

– Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

(3) Open the valve (Lo side on the charge set and charge the system with liquid refrigerant.

– If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure (pumping down-pin).

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the 3-way valve's service port.

– Stopping partway will allow the gas to be discharged.

– If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

(5) Mount the valve stem nuts and the service port nut.

– Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.

– Be sure to check for gas leakage.

⚠ CAUTION

This unit is charged with R-410A.
Pay attention not to charge R-22.

Additional gas charging

(Gas leakage)

- When refrigerant is insufficient by leakage, recharge the unit with the refrigerant up to normal operating suction pressure.
- Use the graph or the equation below to get operating suction pressure according to indoor and outdoor temperature.
  Suction pressure was measured at 3-way valve service port after operating the unit for 10 minutes.

The method of using graph

- Find outdoor temperature.
- Find indoor temperature onto the curve of outdoor temperature.
- Read suction pressure at the axis of ordinates.

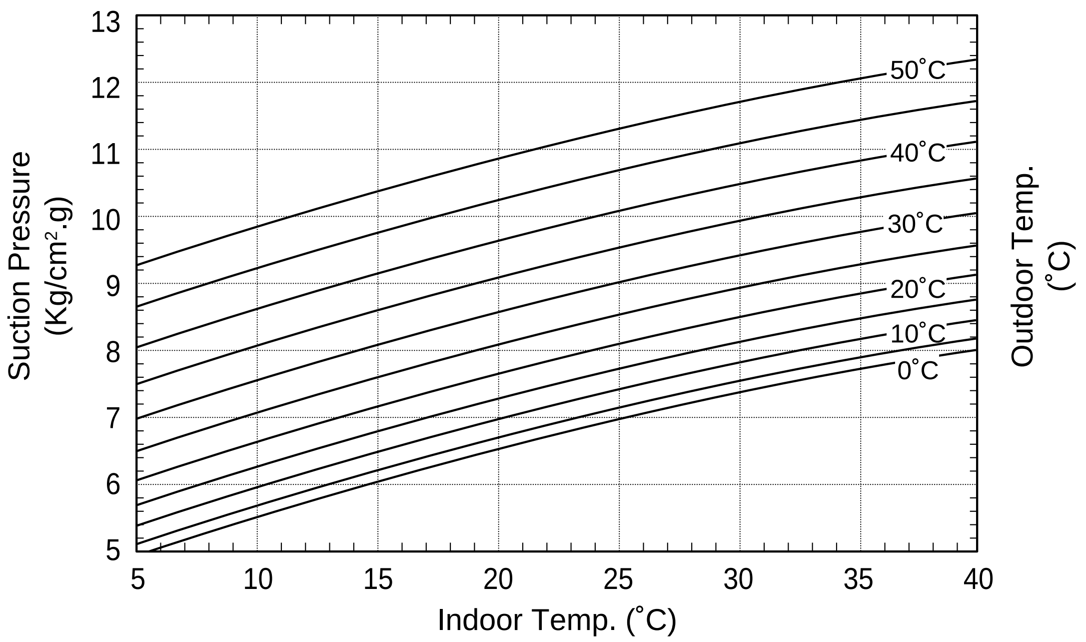
The method of using equation

-. Calculate suction pressure after putting indoor and outdoor temperature into the equation.

Operating Suction Pressure (For R410A)

(According to Indoor & Outdoor Temperature)

(At operating the Unit for 10 minutes)



$$P = 3 + 0.0123 \times T_{out}^{1.5} + 0.8 \times T_{in}^{0.5}$$

Where, P : Suction Pressure($kg/cm^2 \cdot g$)
Tout : Outdoor Temperature(˚C)
Tin : Indoor Temperature(˚C)

Cycle Parts

Trouble analysis

1. Check temperature difference between intake and discharge air and operating current.

Temp. Difference

Operating Current

Condition	Result
Temp. difference : approx. °F(0°C) Current : less than 80% of rated current	• All amount of refrigerant leaked out. Check refrigeration cycle.
Temp. difference : approx. 14°F(8°C) Current : less than 80% of rated current	• Refrigerant leakege Clog of refrigeration cycle Defective compressor
Temp. difference : less than 14°F(8°C) Current : over the reated current	• Excessive amount of refrigerant
Temp. difference : over 14°F(8°C)	• Normal

NOTICE

Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relativery higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle.

Suction pressure (Compared with the normal value)	Temperature (Compared with the normal valve)	Cause of Trouble	Description
Higher	High	Defective compressor Defective 4-way reverse valve	Current is low.
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation.
Lower	Higher	Insufficient amount of refrigerant (Leakage) Clogging	Current is low. Current is low.

NOTICE

1. The suction pressure is usually 8.5~9.5 kg/cm^2G(Cooling) at normal condition.
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

Electronic Parts

Product does not operate at all.

(* Refer to Electronic Control Device drawing and Schematic diagram.)

Turn off Main Power

↓ (After 20 seconds)

Turn on Main Power

↓

Does "beeping" sound is made from the Indoor Unit?

NO ↓

Check the voltage of power(About AC 115V, 60Hz)

- Main power's voltage
- Voltage applied to the unit
- Connecting method of Indoor/Outdoor connecting cable
- Check PWB Ass'y(Outdoor unit)
  - Fuse
  - Pattern damage
  - Varistor(ZNR01J)

↓

Check the connection housing for contacting

- Connector related to CN-POWER
- Connector related to CN-FAN
- Connector contacting of Outdoor Fan/Compressor
- Display PWB Ass'y Check
- Connector related to CN-DC/DC

↓

YES ↓

Primarily, the operating condition of Micom is OK.

↓

Check each load(Indoor/Outdoor Fan Motor, Compressor, Stepping Motor) and contacting condition of related connector(including connecting cable of Indoor/Outdoor Unit)

PCB Board Operation Check

Items	Content	Remedy
• Power Transformer (Outdoor unit) - Input Voltage - Output Voltage ⇩	- About AC115V±10% - Check the power voltage - About DC15V±3	• Replace SMPS Module
• IC01D(7812) Output (Indoor/Outdoor unit) ⇩	• DC +12V	• Replace IC01D
• IC02D(7805) Output (Indoor unit) IC03D(7805) Output (Outdoor unit) ⇩	• DC +5V	• Replace IC02D(Indoor unit) IC02D(Outdoor unit)
• IC01A(KIA7036, Reset IC) Indoor : 16MHz Outdoor : 8MHz	• Voltage of Outdoor unit Micom No. 18, Voltage of Indoor unit Micom No. 43 and soldering condition	• Replace faulty parts

The product is not operate with the remote controller.

Turn on Main Power

While the compressor has been stopped, the compressor does not operate owing to the delaying function for 3 minutes after stopped.

When the compressor stopped Indoor Fan is driven by a low speed. At this point the wind speed is not controlled by the remote controller. (When operated in the Sleeping Mode, the wind speed is set to the low speed by force.)

Cause by the remote controller

When the mark( ) is displayed in LCD screen, replace battery.

When the detect switch(double key) inside the remote controller door is fault, it is impossible to operate temperature regulating(▲/▼) and wind speed selecting.

Check the connecting circuit between the remote controller MICOM (No. ㉚) - R17(2Ω) - IR LED - Q1 - R16(2.2KΩ).

Caused by other parts except the remote controller

Check the contact of CN-DISP connector.

Check DISP PWB Ass'y
- Voltage between CN DISP ① - ⑮ : DC +5V

Check point

- Check the connecting circuit between PIN ㊸ - R11L(1K) - C11L(680PF) - MICOM PIN
- Check Receiver Ass'y

Compressor/Outdoor Fan are unable to drive.

Turn on Main Power

⇩

Operate "Cooling Mode(❈)" by setting the desired temperature of the remote controller is less than one of the indoor temperature by 2°F at least.

⇩

When in Fan Mode, Compressor/Outdoor Fan is stopped.

⇩

Check the sensor for indoor temperature is attached as close as to be effected by the temperature of Heat Exchanger(EVA).

⇩

When the sensor circuit for indoor temperature and connector are in bad connection or are not engaged, Compressor/Outdoor Fan is stopped.

- Check the related circuit of R02H(12.1K), R01H(6.2K), Micom (No.46, 47) (Indoor unit).
- Check the indoor temperature sensor is disconnected or not(About 10kΩ / at 77°F).

⇩

When the temperature around Outdoor PWB Ass'y is above 163°F the compressor is stop and only Outdoor Fan is operating.

⇩

Check Relay(RY - COMP) for driving compressor.

- When the power(About AC110V) is applied to the connecting wire terminal support transferred to compressor, PWB Ass'y is normal.
- Check the circuit related to the relay(Outdoor unit).

Check point	COMP ON	COMP OFF
Between Micom(No. 5) and GND	DC5V	DC0V
Between IC01M, IC02M(No. 9) and IC01M, IC02M(No. 8)	Below DC 1V (app)	About DC12V

⇩

Turn off Main Power

⇩

- Check the electrical wiring diagram of outdoor side.
- Check the abnormal condition for the component of Compressor/Outdoor Fan Motor.

When indoor Fan does not operate.

Does the voltage of each terminals of CN-MOTOR CONNECTOR in Indoor unit corresponds to values in the Table of page 52

Does the voltage of terminal of CN-DC/DC CONNECTOR in Indoor unit corresponds to the values in the table of page 52

Do the voltage of terminal of CN-DC/DC CONNECTOR in Outdoor unit corresponds to the values in the table of page 52

NO → Check the patterns and the conditions of outdoor unit PWB Assy's.

YES → Check the connecting condition and disconnection of connecting wires between Indoor and Outdoor unit.

Check the pattern and the condition of Indoor unit PWB Ass'y.

Check connecting condition of the CN-MOTOR CONNECTOR

Check the interference of Indoor Fan.

Check the motor of Indoor Fan

※ Indoor Fan may be stopped in the Soft Dry Mode(change to the Cooling Operation Mode).

※ Indoor Fan is to be stopped when Indoor pipe(coil) termperature is lower than 79°F.
(At that times, Defrost indicator is turned on)

When Vertical Louver does not operate.

- Confirm that the Vertical Louver is normally geared with the shaft of Stepping Motor.
- If the regular torque is detected when rotating the Vertical Louver with hands ⇒ Normal

⇩

- Check the connecting condition of CN-UP/DOWN Connector
- Check the soldering condition(on PWB) of CN-UP/DOWN Connector

⇩

Check the operating circuit of the Vertical Louver

- Confirm that there is DC +12V between pin⑤(RED) of CN-UP/DOWN and GND.
- Confirm that there is a soldering short at following terminals.
  - Between ⑺, ⑻, ⑼ and ⒇ of MICOM
  - Between ④, ⑤, ⑥ and ⑦ of IC01M
  - Between ⑩, ⑪, ⑫ and ⑬ of IC01M
  - Between ①, ②, ③, ④ and ⑤ of CN-UP/DOWN

⇩

If there are no problems after above checks

- Confirm the assembly conditions that are catching and interfering parts in the rotation radial of the Vertical Louver

When a comunication error occurs.

- The operation indicator of Indoor unit blinks five times.
- The red indicator of Outdoor unit blinks five times.

⇩

Check the connecting wires between Indoor and Outdoor unit for the connecting error and the contacting condition.

⇩

Check the installation condition of outdoor unit.

⇩

Check for the communication error and the operating condition of product after also operating with the remote controller, then taking above 2 minutes.

⇩

Apply the power again after about 20 seconds by the power of Outdoor unit is off.

⇩

Check for the communication error and the operating condition of product after also operating with the remote controller, then taking above 2 minutes.

⇩

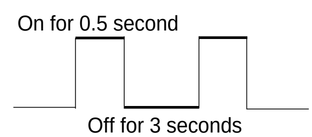
Check the PWB assembly of Indoor and Outdoor unit.

⚠ CAUTION

If the connecting wires of Indoor and Outdoor unit are not connected within 2 minutes after the power of Outdoor unit is applied, a communication error will occur. Therefore, the power should be applied after connecting them.

The phenomena in case of connecting error

INDOOR UNIT

Connector Type	Condition	Phenomena
CN-DC/DC  ① Blue ② Black ③ Brown ④ Red	Open and connecting error	• The same as the phenomenon of Outdoor Unit.
CN-MOTOR	Open	• The indoor fan does not operate. • The operation indicator of Indoor unit blinks 8 times.
CN-UP/DOWN	Open	• The up/down vane does not operate.
	Short between terminals	• The up/down vane does not smoothly operate.
CN-DISP	Open	• It does not operate with a remote controller.
CN-TH	Open	• The operation indicator blinks once.  • The compressor and the outdoor fan stop. • The indoor fan speed is low.
	Short between terminals (① and ③) CN-TH2.	• The operation indicator blinks once (on for 0.5 second, off for 3 seconds). • The compressor operates continuously regardless of the setting temperature and the variation of room temperature.
	Short between terminals (① and ③) CN-TH1.	• The operation indicator blinks once (on for 0.5 second, off for 3 seconds) • Continuous operation

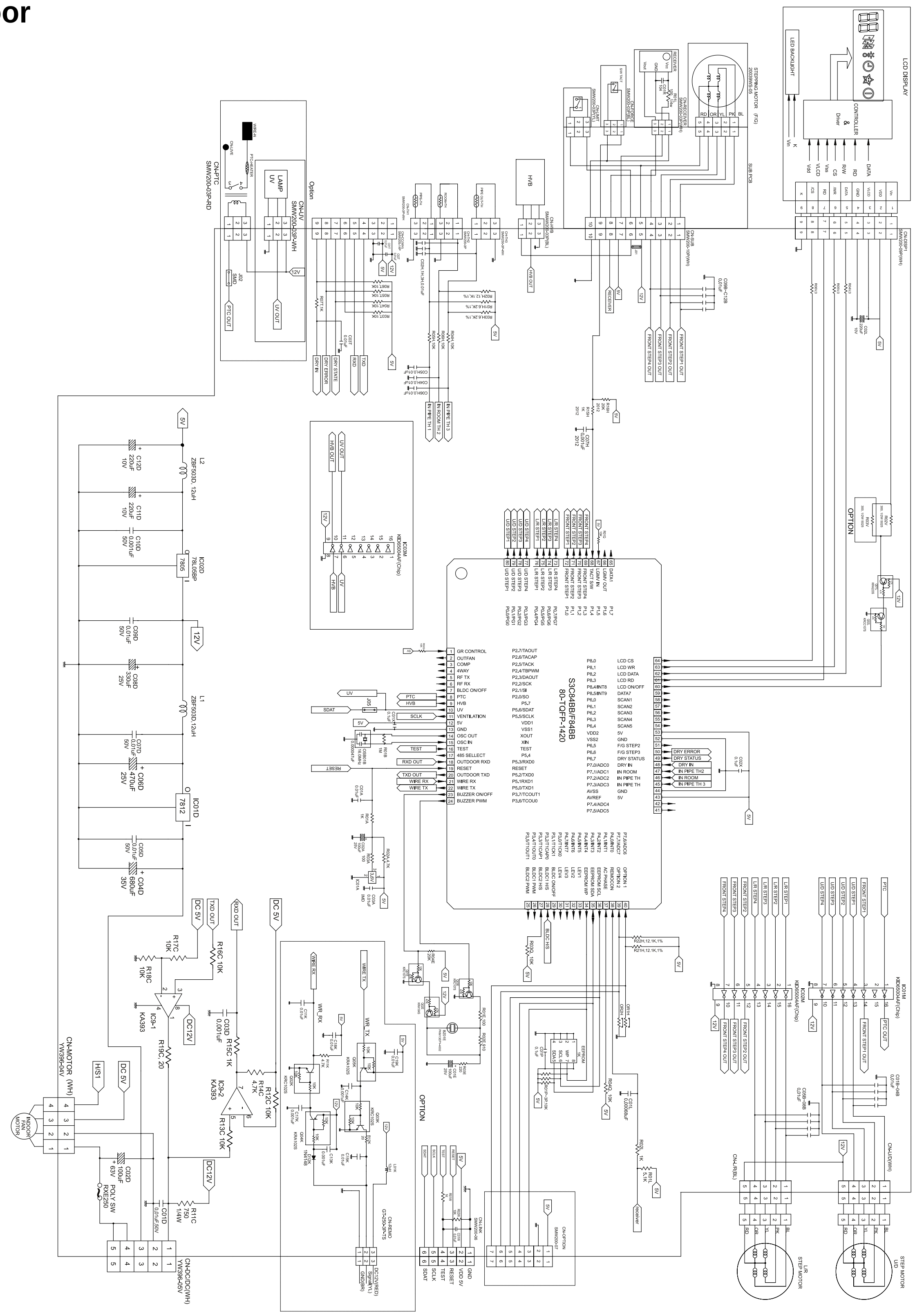
OUTDOOR UNIT

Connector Type	Condition	Phenomena
CN-POWER	OPEN	• All functions stop. • The operation with the remote controller, forced and test one do not operate.
	Connecting reversely	• PWB pattern is damaged when applying the power.
RY-COMP terminal	OPEN	• All functions stop or the compressor does not operate. • The operation with the remote controller, forced and test one do not operate.
	Connecting reversely	• All functions stop. • The operation with the remote controller, forced and test one do not operate.
CN-TRANS	OPEN	• All functions stop. • The operation with the remote controller, forced and test one do not operate.
CN-FAN	OPEN	• The Indoor Fan does not operate.
The connecting wire of CN-DC/DC, and Indoor and Outdoor Unit ④ ③ ② ① ① Blue ② Black ③ Brown ④ Red	OPEN	• All functions stop. • The operation with the remote controller, forced and test one do not operate.
	Connecting error (① ↔ ②)	• The only signal of remote controller operation/stop is inputted, but the product does not operate. • The RED indicator of outdoor unit blinks 5 times after 2 minutes with applying the power.
	Connecting error (① ↔ ③)	• The beep sound, such as "beep, beep, beep, beep, beep", occurs periodically in Indoor unit. • The signal input of a remote controller and operation of product is impossible. • The RED indicator blinks 5 times after 2 minutes with applying the power.
	Connecting error (① ↔ ④)	• The signal of remote controller is inputted, but the product does not operate. • The RED indicator of outdoor unit and the operation indicator of indoor one blinks 5 times after 2 minutes with applying the power.
	Connecting error (② ↔ ③)	• No power for Indoor unit. • The signal input of the remote controller and operation of product is impossible. • The thermal protector of the Power Trans operates when let it alone for long time.
	Connecting error (② ↔ ④)	• The signal of the remote controller is inputted. • The fuse and Q61 in the Outdoor unit are damaged when the indoor fan is operated.
	Connecting error (③ ↔ ④)	• No power for Indoor unit. • The signal input of the remote controller and operation of product is impossible. • The RED indicator of the Outdoor unit blinks 5 times after 2 minutes with applying the power.

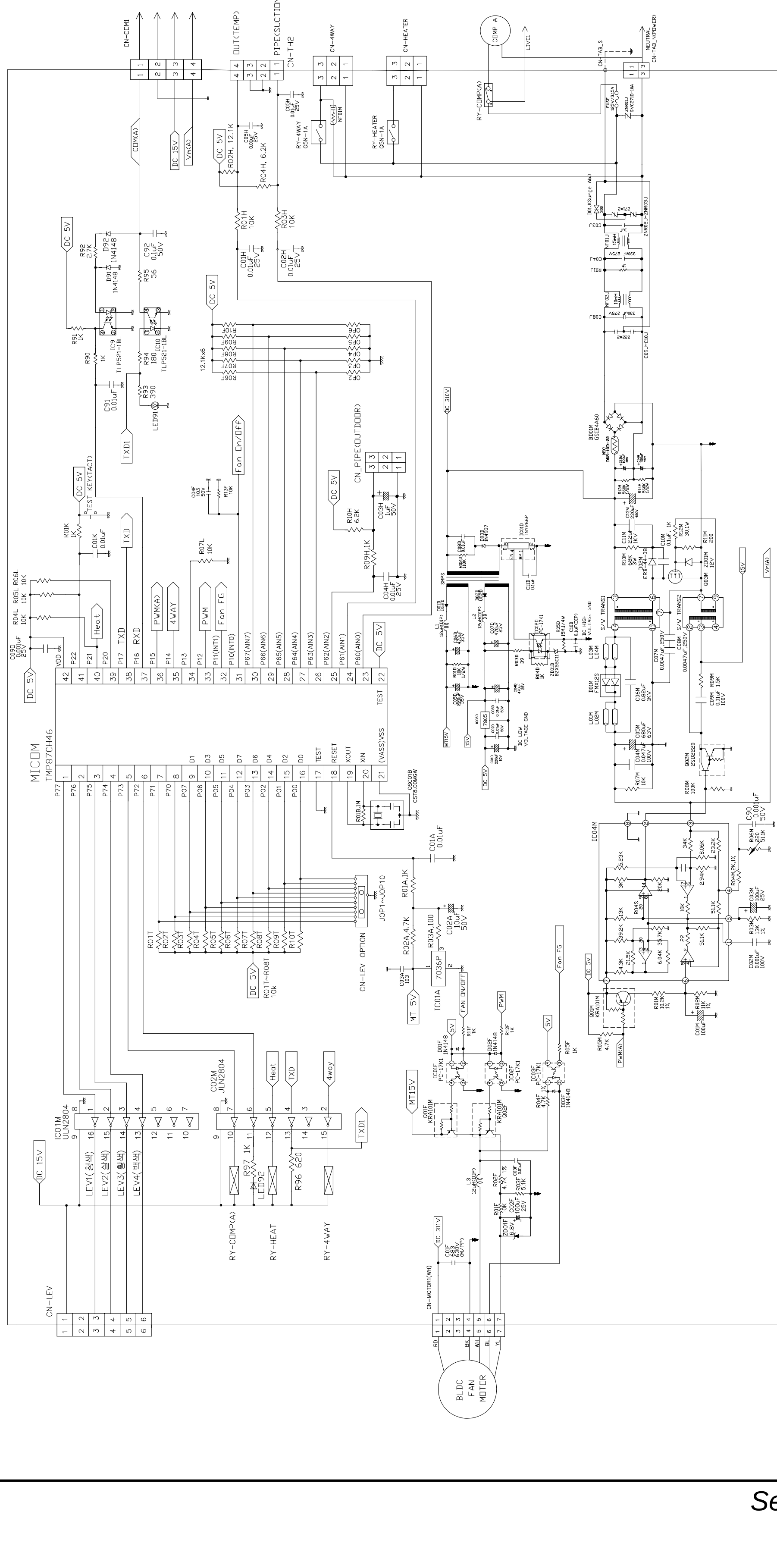
Schematic Diagram

Electric Control Device

■ Indoor

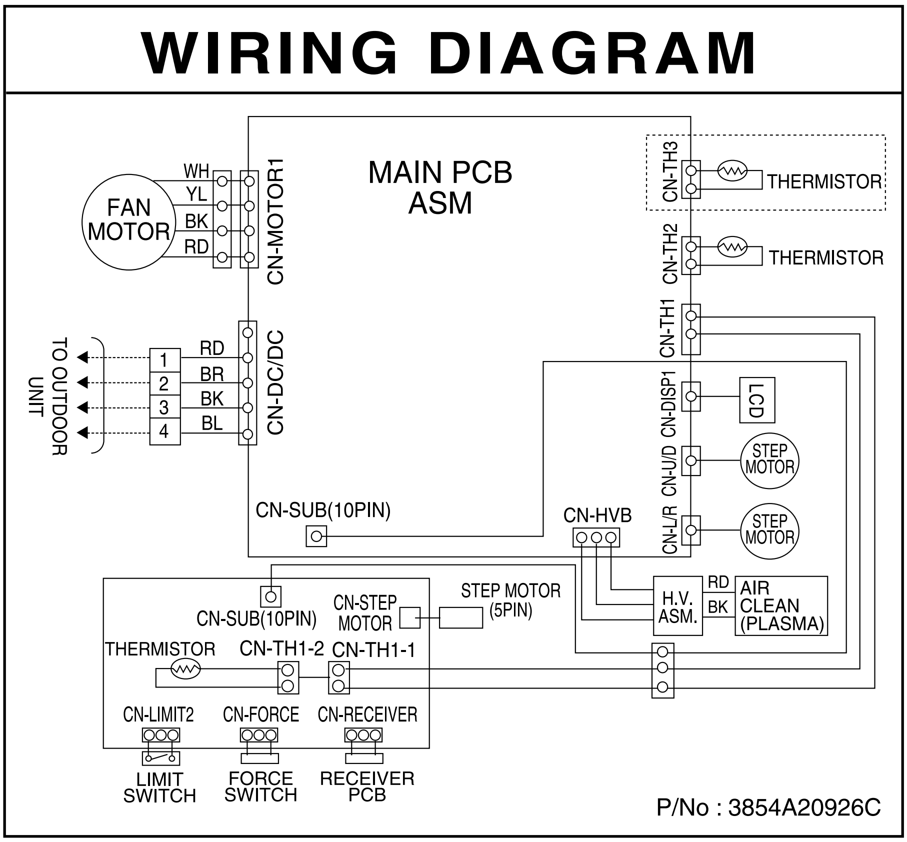


■ Outdoor (12k)



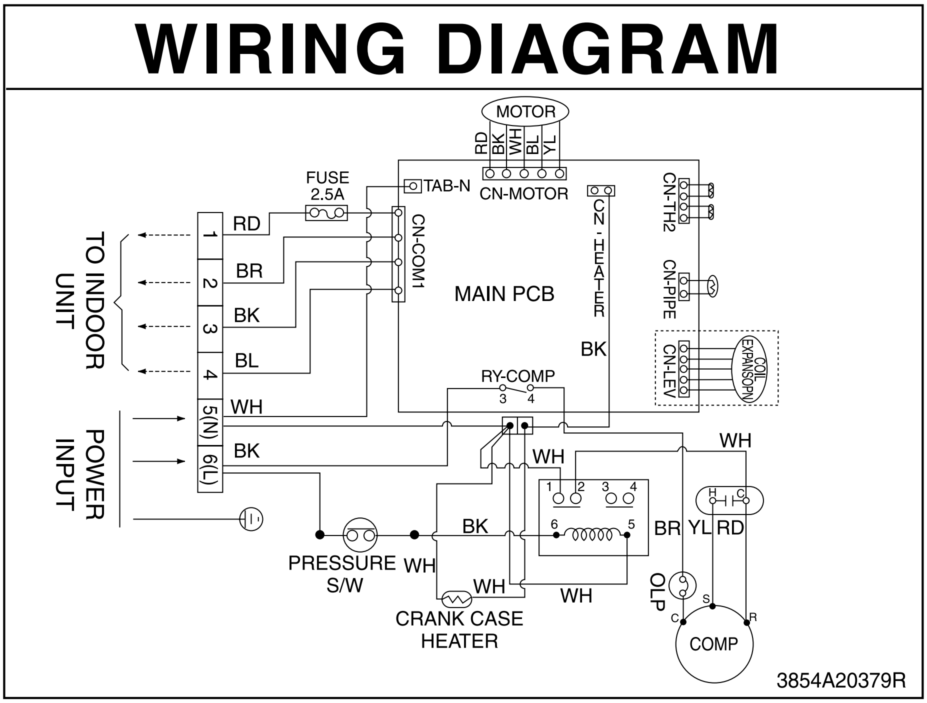
Wiring Diagram

■ Indoor Unit
Models: 12k

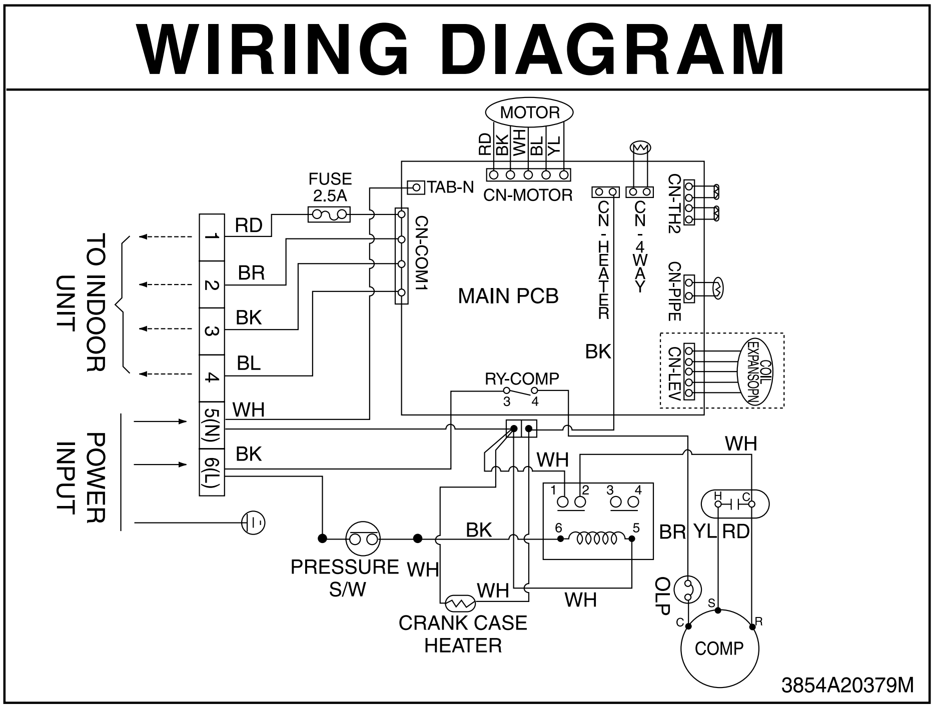


■ Outdoor Unit

Models: 12k(C/O)



Models: 12k(H/P)

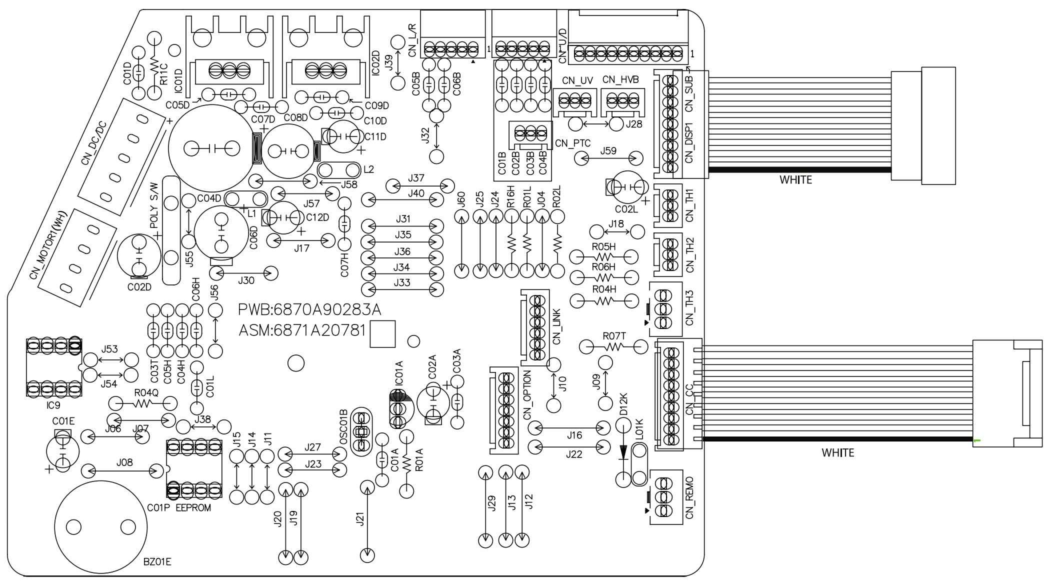


Components Location

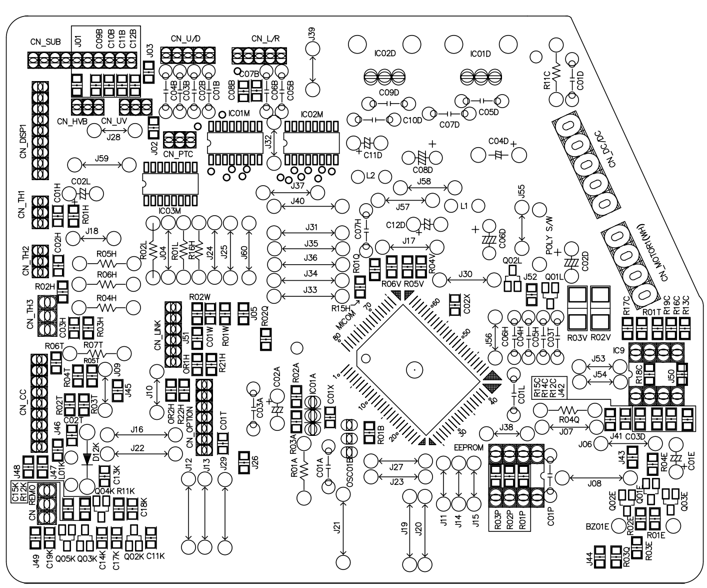
■ Indoor

MAIN P.W.B ASSEMBLY

• TOP VIEW

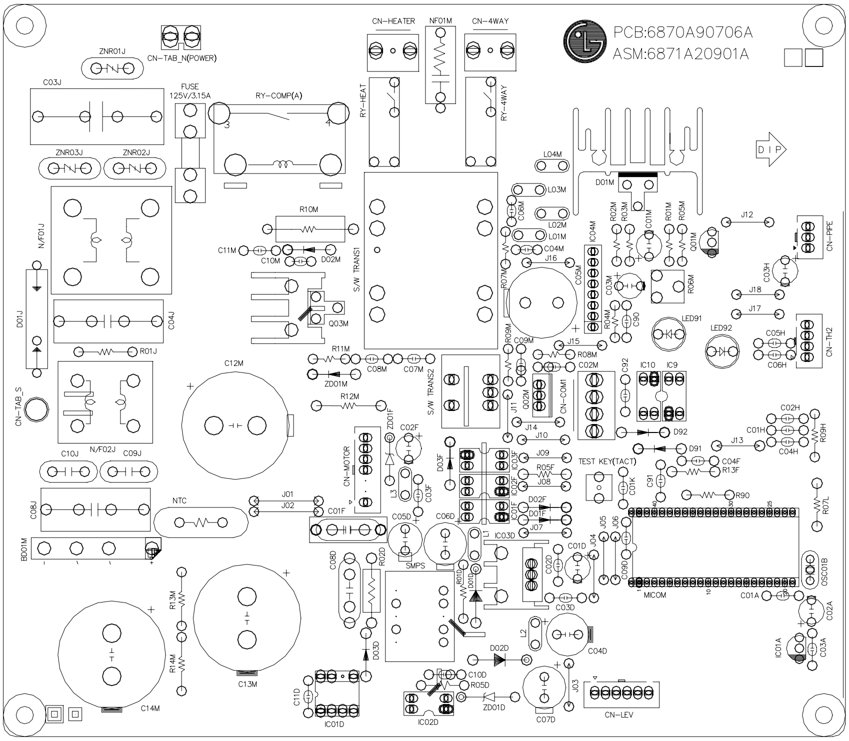


• BOTTOM VIEW

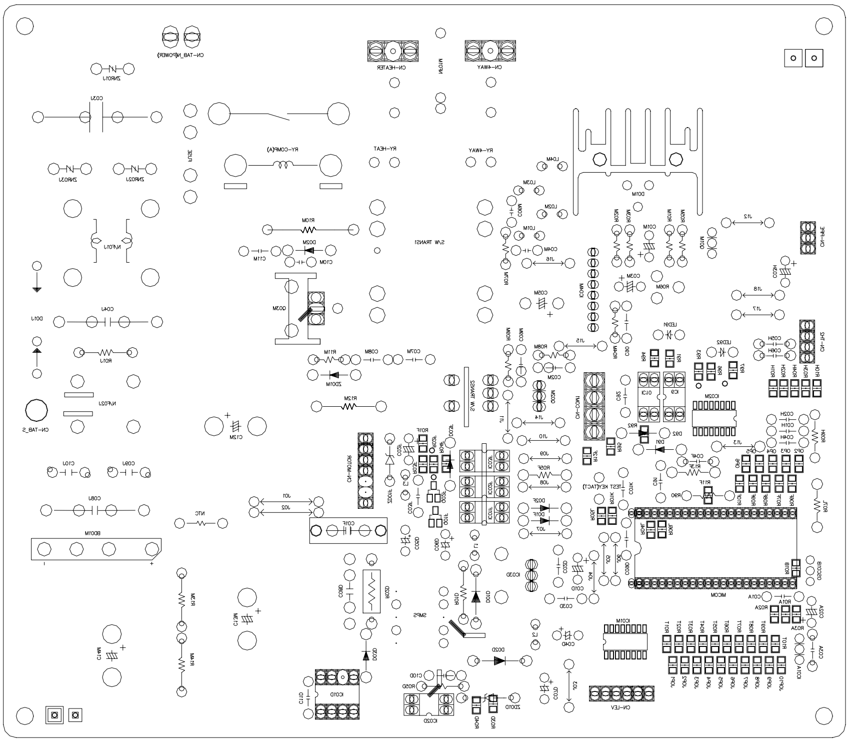


■ Outdoor(12k)

• TOP VIEW

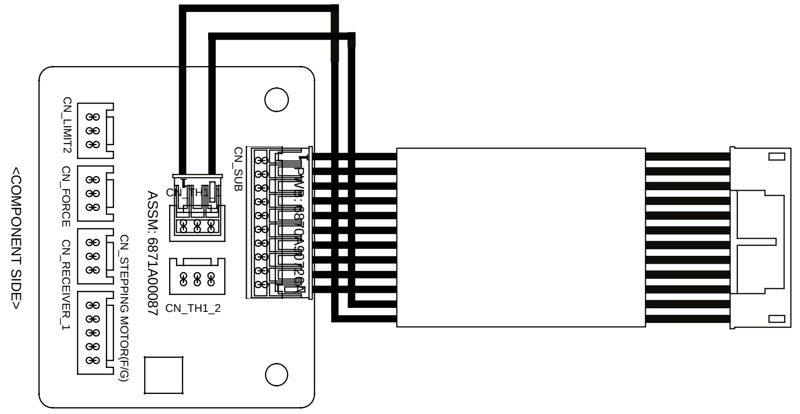


• BOTTOM VIEW

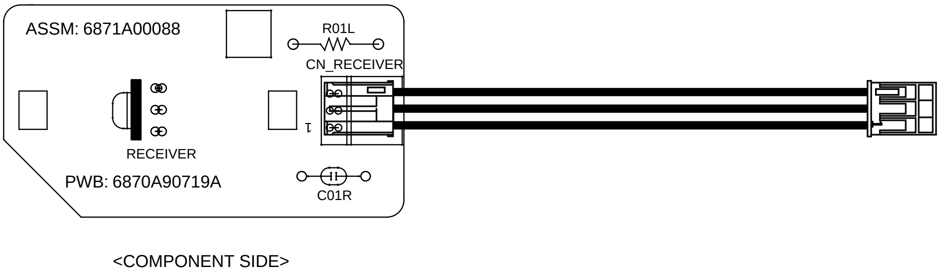


DISPLAY ASSEMBLY

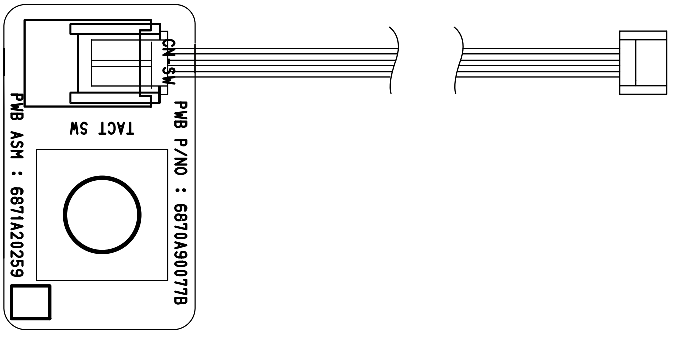
– 6871A00087B



– 6871A00088A

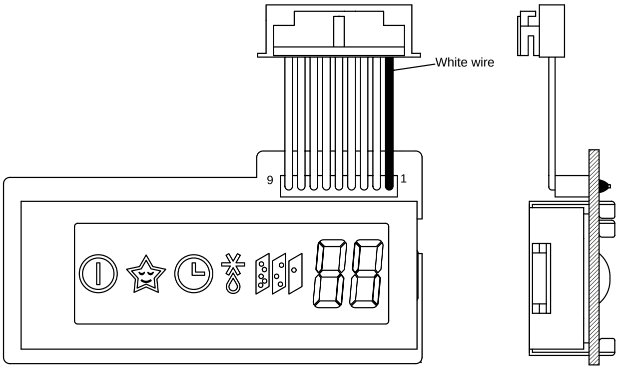


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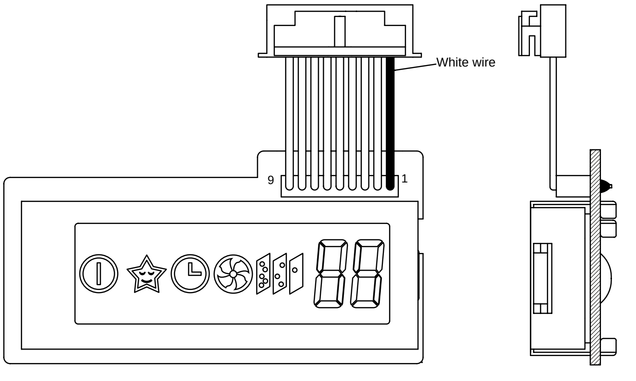


LCD MODULE

– 6306A90009A



– 6306A90009C



Product Specifications

Cooling Only

Item		Unit	LA*121CNM (AS-C121ERH0) LA121CPM* (AS-C121ERH0)
Power Supply		Ø, V, Hz	1, 115V, 60
Cooling Capacity		BTU/h	11,500
Input		W	1,150
Running Current		A	10.5
COMP. Locked Rotor AMP.		A	57
S.E.E.R			13
Air Circulation		m^3G/min(cfm)	9.3(330)
Moisture Removal		l/h(pts/hr)	1.4(3.0)
Noise Level (Sound Pressure, 1m)	Indoor, High	dB(A)	41
	Med	dB(A)	36
	Low	dB(A)	34
	Outdoor, Max	dB(A)	48
Features	Temperature Control		themistor
	Air Deflection		4-way
	Steps, Fan/Cool		3/4
	Air Deflection Control(up&down)		auto
	Air Deflection Control(left&right)		auto
	Remocon Type		Wireless LCD
	Setting Temperature Range, Cooling Mode		64~86°F
	Temperature Increment		2°F(1°C)
	Auto Operation(electronic control)		Yes
	Self Diagnosis		Yes
	Timer		24hr , on/off
	Sleep Operation		Yes
	Healthy Dehumidification Mode		Yes
	Restart Delay	minutes	3
Refrigerant(R-410a) Charge		g(oz)	930(32.8)
Power cord		AWG#:P*mm^2	14:3*2.5
Fuse of breaker Capacity		A	20
Connecting Cable		AWG#:P*mm^2	18:4*0.75
Connecting Tube (Ø, Socket Flare)	Liquid Side	mm(in)	6.35(1/4)
	Gas Side	mm(in)	12.7(1/2)
	Length, std	m(ft)	7.5(25)
Additional Drain Hose(outer Dia.)		mm(in)	15.5(5/8)
Dimensions (WxHxD)	Indoor	mm	915*282*165
		in	36.0*11.1*6.5
	Outdoor	mm	770*540*245
		in	30.3*21.3*9.6
Net Weight	Indoor	Kg(lbs)	9.3(20.5)
	Outdoor	Kg(lbs)	33(72.8)
Gross Weight	Indoor	Kg(lbs)	11(24.3)
	Outdoor	Kg(lbs)	33.3(73.4)

* Design and specifications subject to change without prior notice for product improvement.

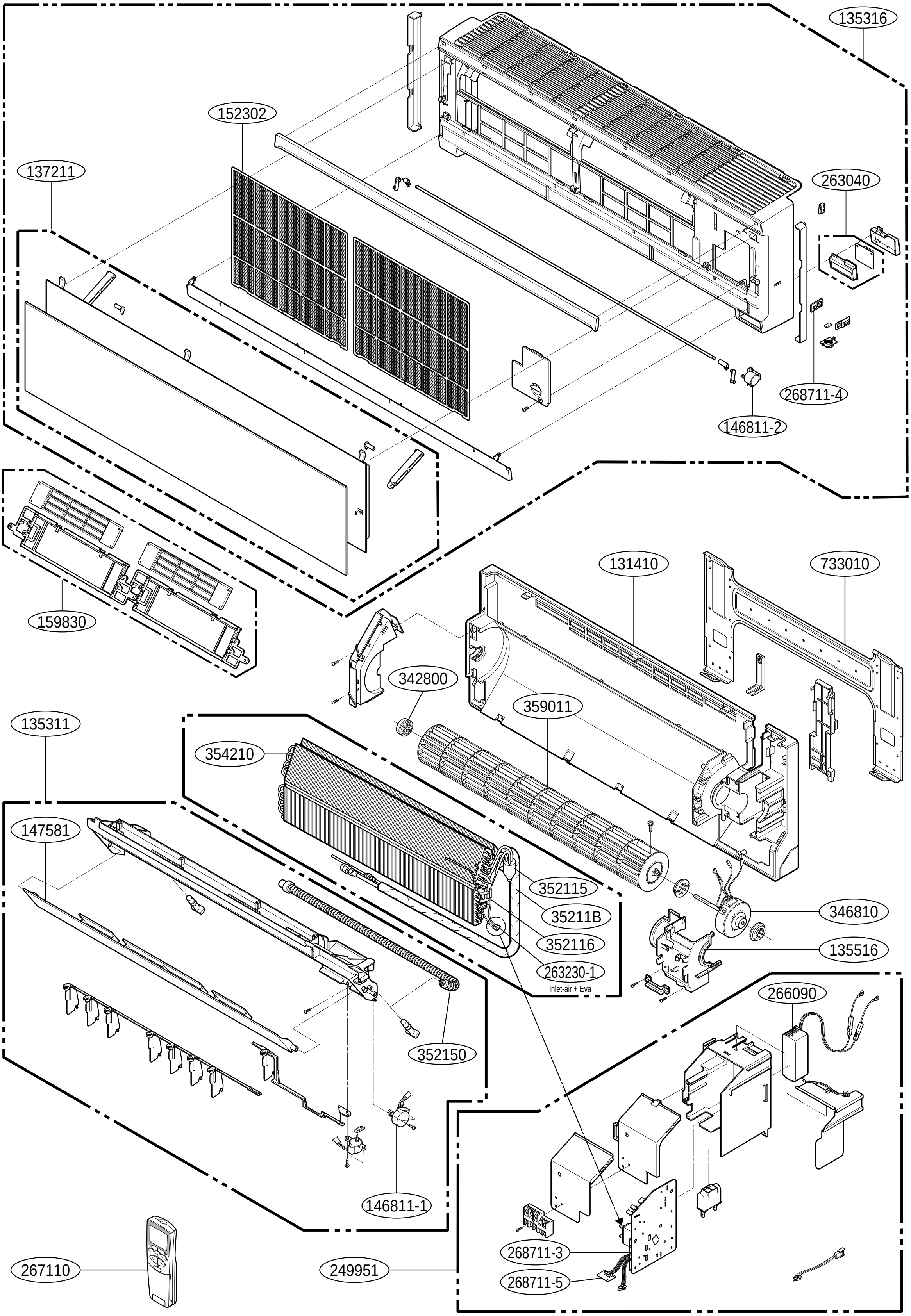
Cooling & Heating

Items		Unit	LA*121HNM (AS-H121ERH0) LA121HPM* (AS-H121ERH0)
Power Supply		ø, V, Hz	1, 115V, 60
Cooling Capacity		BTU/h	11500
Heating Capacity		BTU/h	11500
Input	Cooling	W	1150
	Heating	W	1150
Running Current	Cooling	A	10.5
	Heating	A	10.5
COMP. Locked Rotor AMP.	Cooling	A	57
	Heating	A	57
S.E.E.R			13
H.S.P.E			7.8
Air Circulation		m^3/min(cfm)	9.3(330)
Moisture Removal		l/h(pts/hr)	1.4(3.0)
Noise Level (Sound Pressure, 1m)	Indoor, High	dB(A)	41
	Med	dB(A)	36
	Low	dB(A)	34
	Outdoor, Max	dB(A)	48
Features	Temperature Control		themistor
	Air Deflection		4-way
	Steps, Fan/Cool/Heat		3/4/3
	Airflow Direction Control(up&down)		auto
	Airflow Direction Control(left&right)		auto
	Remocon Type		Wireless LCD
	Setting Temperature Range, Cooling Mode		64~86°F
	Heating Mode		60~86°F
	Temperature Increment		2°F(1°C)
	Auto Operation(electronic control)		Yes
	Self Diagnosis		Yes
	Timer		24hr , on/off
	Sleep Operation		Yes
	Healthy Dehumidification Mode		Yes
	Restart Delay	minutes	3
	Defrost Control		Yes
	Hot Start		Yes
Refrigerant(R410A) Charge		g(oz)	930(32.8)
Power cord		AWG #: P*mm^2	14:3*2.5
Fuse or breaker Capacity		A	20
Connecting Cable		AWG #: P*mm^2	18:4*0.75
Connecting Tube (ø. Socket Flare)	Liquid Side	mm(in)	6.35(1/4)
	Gas Side	mm(in)	12.7(1/2)
	Length, std	m(ft)	7.62(25)
Additional Drain Hose(Outer Dia.)		mm(in)	15.5(5/8)
Dimensions (WxHxD)	Indoor	mm	915*282*165
		in	36.0*11.1*6.5
	Outdoor	mm	770*540*245
		in	30.3*21.3*9.6
Net Weight	Indoor	kg(lbs)	9.3(20.5)
	Outdoor	kg(lbs)	33(72.8)
Net Weight	Indoor	kg(lbs)	11(24.3)
	Outdoor	kg(lbs)	33.3(73.4)

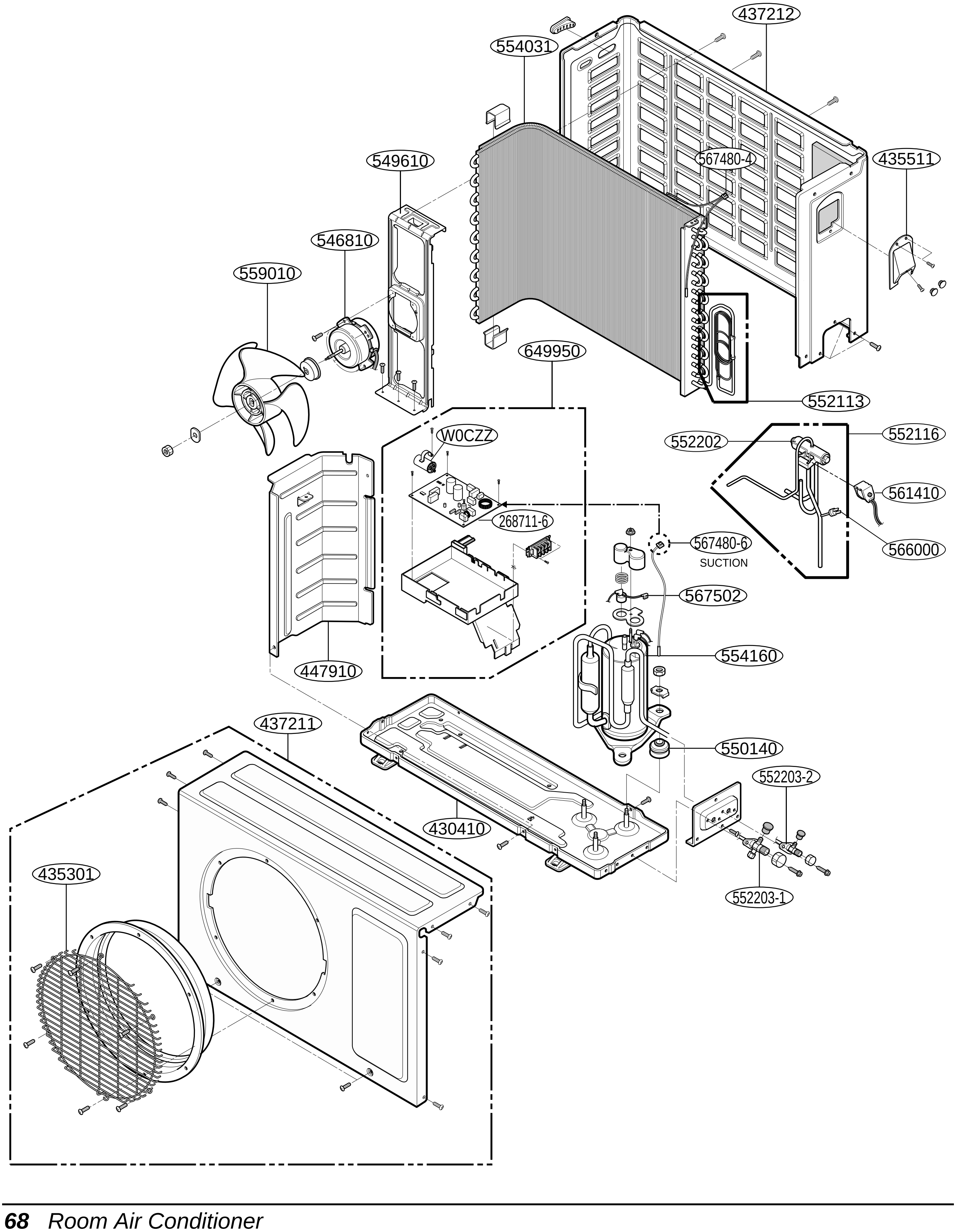
* Design and Specifications subject to change without prior notice for product improvement.

Exploded View

Indoor Unit



Outdoor Unit: 12k Btu/h Seriess



Replacement Parts List

Parts List (Indoor)

LOCATION No.	DESCRIPTION	PART No.		REMARKS
		LAN121CNM(ASNC121ERH0) LA121CPMI(ASNC121ERH0)	LAN121HNM(ASNH121ERH0) LA121HPMI(ASNH121ERH0)	
131410	CHASSIS ASSEMBLY	3141A20034C	3141A20034C	
359011	FAN ASSEMBLY,CROSS FLOW	5901A20017H	5901A20017H	
346810	MOTOR ASSEMBLY,AC,INDOOR	4681AR2295L	4681AR2295L	
342800	BEARING	4280A20004A	4280A20004A	
135516	COVER ASSEMBLY,MOTOR	3551A20156B	3551A20156B	
354210	EVAPORATOR ASSEMBLY,FIRST	5421A20258B	5421A20258B	
35211B	TUBE ASSEMBLY,TUBING	5211A29044B	5211A29044B	
352115	TUBE ASSEMBLY,EVAPORATOR(IN)	5211A29042A	5211A29042A	
352116	TUBE ASSEMBLY,EVAPORATOR(OUT)	5211A29043B	5211A29043B	
135311	GRILLE ASSEMBLY,DISCHARGE(INDOOR)	3531A10373B	3531A10373B	
147581	LOUVER,HORIZONTAL	5990A20072A	5990A20072A	
146811-1	MOTOR ASSEMBLY,DC,STEPPING	4681A20055A	4681A20055A	DISCHARGE
249951	CASE ASSEMBLY,CONTROL(INDOOR)	4995A10205L	4995A10205K	
268711-3	PCB ASSEMBLY,MAIN	6871A20781B	6871A20781A	
263230-1	THERMISTOR ASSEMBLY	6323A30002F	6323A30002F	INLET AIR + EVA MIDDLE
266090	HVPS,DC/DC	6609A10003Z	6609A10003Z	
733010	PLATE ASSEMBLY,INSTALLATION	3301A20020A	3301A20020A	
135316	GRILLE ASSEMBLY,FRONT(INDOOR)	3531A10374X	3531A10374H	
137211	PANEL ASSEMBLY,FRONT(INDOOR)	3721A20326A	3721A20326A	
152302	FILTER,AIR	5230A20064A	5230A20064A	
146811-2	MOTOR ASSEMBLY,DC,STEPPING	4681A20055D	4681A20055D	FRONT
268711-5	PCB ASSEMBLY,SUB	6871A00087B	6871A00087B	OPTION
268711-4	PCB ASSEMBLY,SUB	6871A20259D	6871A20259D	LIMIT S/W
263040	LCD,MODULE-TN	6306A90009C	6306A90009A	
267110	REMOTE CONTROLLER ASSEMBLY	6711A20128J	6711A20128H	
352150	HOSE ASSEMBLY,DRAIN	5251A20011G	5251A20011G	
159830	FILTER ASSEMBLY,AIR CLEANER	5983A20018G	5983A20018G	

NOTE) ⁎Please ensure GCSC since these parts may be changed depending upon the buyer's request.
(GCSC WEBSITE http://biz.LGservice.com)

Parts List (Outdoor)

LOCATION No.	DESCRIPTION	PART No.		REMARKS
		LAU121CNM (ASUC121ERH0) LA121CPMO (ASUC121ERH0)	LAU121HNM (ASUH121ERH0) LA121HPMO (ASUH12ERH0)	
430410	BASE ASSEMBLY,OUTDOOR	3041A20008K	3041A20008K	-
552203-2	VALVE,SERVICE	2H02479N	2H02479N	GAS PIPE
552203-1	VALVE,SERVICE	5220A20006A	5220A20006A	LIQUID PIPE
554031	CONDENSER ASSEMBLY,BENDING	5403A20221C	5403A20221C	-
549610	BRACKET ASSEMBLY,MOTOR(OUTDOOR)	4961A10015B	4961A10015B	-
546810	AC MOTOR ASSEMBLY	4681A20122B	4681A20122B	-
559010	FAN ASSEMBLY,PROPELLER	5901A10033A	5901A10033A	-
447910	BARRIER ASSEMBLY,OUTDOOR	4791A30002U	4791A30002U	-
550140	DAMPER,COMPRESSOR	4H00982E	4H00982E	-
554160	COMPRESSOR SET,KOREA	2520UGAC2AA	2520UGAC2AA	-
567502	OVERLOAD PROTECT	6750U-L029A	6750U-L029A	-
552113	TUBE ASSEMBLY,CONDENSER(OUT)	5211A24118B	5211A24118B	-
552116	TUBE ASSEMBLY,REVERSE	5211A26008A	5211A26008A	-
552202	VALVE,REVERSE	5220AR3228D	5220AR3228D	-
566000	SWITCH,PRESSURE	6600L000013	6600L000013	-
561410	SOLENOID	-	6141A90007C	ONLY H/P MODEL
649950	CASE ASSEMBLY,CONTROL(OUTDOOR)	4995A21006Q	4995A21006Q	-
268711-6	PCB ASSEMBLY,MAIN	6871A20901B	6871A20901B	OUTDOOR PCB
567480-4	THERMISTOR,NTC	6323A20002L	6323A20002L	INLET-AIR + COND. OUT
567480-6	THERMISTOR,NTC	6323A20016A	6323A20016A	SUCTION PIPE TEMP.
W0CZZ	CAPACITOR,FILM,BOX	6120AR2359U	6120AR2359U	-
437212	PANEL ASSEMBLY,REAR(OUTDOOR)	3721A20026M	3721A20026M	-
437211	PANEL ASSEMBLY,FRONT(OUTDOOR)	3721A20027Q	3721A20027Q	-
435301	GRILLE,DISCHARGE	3530A20006G	3530A20006G	-
435511	COVER ASSEMBLY,CONTROL(OUTDOOR)	3551AR7184R	3551AR7184R	REAR PANEL

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